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DICTIONARY FILE UPDATES: 29 MAR 2011 HIGHEST RN 1272065-66-3

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=> fil hcapp  
FILE 'HCAPLUS' ENTERED AT 15:35:11 ON 30 MAR 2011  
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FILE COVERS 1907 - 30 Mar 2011 VOL 154 ISS 14  
FILE LAST UPDATED: 29 Mar 2011 (20110329/ED)  
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Feb 2011  
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Feb 2011

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the fourth quarter of 2010.

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This file contains CAS Registry Numbers for easy and accurate substance identification.

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=> d que stat 162
L1          2 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON US2006-588481/AP

L4          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON BIPHENYL/CN
L5          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON ISOPROPYLBENZENE/CN
L6          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON VINYLBENZENE/CN

L7          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON ETHYLBENZENE/CN

L8          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON TOLUENE/CN
L9          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON T-BUTYLBENZENE/CN
L12         1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON THIOPHENE/CN
L13         1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON CYCLOHEXYLBENZENE/CN

L16         47196 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L4
L17         13306 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L5
L18         81745 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L6
L19         32688 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L7
L20         115160 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8
L21         3436 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L9
L24         14762 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L12
L25         1834 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L13
L28         QUE SPE=ON ABB=ON PLU=ON (LI OR LITHIUM) (A) SALT
L29         QUE SPE=ON ABB=ON PLU=ON ELECTROLY?
L30         QUE SPE=ON ABB=ON PLU=ON ELECTROLY?(A) (SOLVENT OR SOLUT
UTION)
L31         799 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L16 AND L17
L32         11 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L31 AND L29
L33         2 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L32 AND L28
L34         8046 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L18 AND L19
L35         44 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L34 AND L29
L36         2 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L35 AND L28
L37         QUE SPE=ON ABB=ON PLU=ON LI OR LITHIUM
L45         1951 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L20 AND L21
L46         27 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L45 AND L29
L47         1 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L46 AND L28
L52         49 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L24 AND L25
L53         12 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L52 AND L37
L54         6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L53 AND L28
L58         6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L54 AND L30
L60         8 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L36 OR L47 OR
L58 OR L33
L62         7 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L60 NOT L1
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=> d ibib abs hitstr hitind 162 1-7

L62 ANSWER 1 OF 7 HCAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2010:1632085 HCAPLUS Full-text  
DOCUMENT NUMBER: 154:92307  
TITLE: High voltage electrolyte  
INVENTOR(S): Muldoon, John; Allred, Gary; Dotse, Anthony  
PATENT ASSIGNEE(S): Toyota Motor Engineering & Manufacturing North America, Inc., USA  
SOURCE: PCT Int. Appl., 16pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent

LANGUAGE : English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010151639	A2	20101229	WO 2010-US39781	201006 24
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW	RW: AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM	US 20110008680	A1 20110113	US 2010-822444 201006 24
PRIORITY APPLN. INFO.:			US 2009-219996P	P 200906 24

## OTHER SOURCE(S): MARPAT 154:92307

- AB An organic electrolyte solvent includes a compound of the formula: R1-SO<sub>2</sub>-NR2-OR3 wherein R1 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs. and perfluorinated analogs; R2 is selected from alkanes, alkynes, aryls and their substituted derivs.; R3 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs. wherein the electrolyte solvent is stable at voltages of greater than 4.0 V.
- IT 110-02-1, Thiophene 827-52-1,  
 Cyclohexylbenzene
- RL: MOA (Modifier or additive use); USES (Uses)  
 (high voltage electrolyte)
- RN 110-02-1 HCPLUS
- CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCPLUS  
 CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M0010-0569 [I,A]; H01M0010-0567 [I,A]; H01M0010-0525 [I,A];  
 C07C0311-01 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 57-50-1D, nitrile derivs., uses 75-52-5, Nitromethane, uses  
 79-22-1, Methyl chloroformate 92-85-3, Thianthrene 96-47-9,  
 2-Methyltetrahydrofuran 96-49-1, Ethylene carbonate 96-49-1D,  
 Ethylene carbonate, halogenated 96-54-8, N-Methylpyrrole  
 100-66-3, Anisole, uses 100-66-3D, Anisole, fluoro derivs.  
 100-69-6, 2-Vinylpyridine 102-09-0, Diphenyl carbonate 103-26-4,  
 Methyl cinnamate 107-13-1, Acrylo nitrile, uses 108-05-4, Vinyl  
 acetate, uses 108-31-6, Maleic anhydride, uses 108-95-2D,  
 Phenol, carboxyl derivative 109-73-9, Butylamine, uses 110-00-9,  
 Furan 110-00-9D, Furan, derivs. 110-02-1, Thiophene  
 110-42-9, Methyl decanoate 112-02-7, Cetyl trimethylammonium  
 chloride 112-66-3, Dodecyl acetate 123-56-8, Succinimide  
 287-87-6D, Borole, compound 289-56-5D, Boroxine, compds. 358-63-4,  
 Tris(2,2,2-trifluoroethyl)phosphate 538-75-0 541-59-3, Maleimide  
 554-14-3, 2-Methylthiophene 604-88-6, Hexaethylbenzene  
 613-32-1D, Dihydrophenazine, derivs. 670-54-2, Tetracyanoethylene  
 680-31-9, Hexamethyl phosphoramide 778-22-3, 2,2-Diphenylpropane  
 827-52-1, Cyclohexylbenzene 872-36-6, Vinylene carbonate  
 872-50-4, 1-Methyl-2-pyrrolidinone, uses 996-50-9,  
 N,N-Diethylaminotrimethylsilane 1109-15-5,  
 Tris(pentafluorophenyl)borane 1303-86-2, Boron oxide (B2O3), uses  
 1314-56-3, Phosphorus oxide (P2O5), uses 1330-20-7, Xylene, uses  
 1469-70-1, Allyl ethyl carbonate 4074-90-2, Divinyl adipate  
 4427-96-7, Vinyl ethylene carbonate 6627-89-0, Phenyl tert-butyl  
 carbonate 7323-63-9 7440-42-8D, Boron, compds., lithium  
 salts 7446-09-5, Sulfur dioxide, uses 7664-38-2D,  
 Phosphoric acid, trialkyl ester 7664-39-3, Hydrogen fluoride, uses  
 7704-34-9D, Sulfur, compds. 7784-23-8, Aluminum iodide  
 7789-24-4, Lithium fluoride, uses 9004-34-6D, Cellulose,  
 nitrile derivs. 13139-17-8, N-Benzylxy carbonyloxy succinimide  
 13283-31-3D, Borane, compound 13781-53-8, 3-Thiopheneacetonitrile  
 13841-20-8, Tin iodide (SnI) 14213-97-9D, Borate, compound  
 15477-76-6, Phosphonate 27215-51-6, Tetramethylphenylenediamine  
 29457-72-5, Lithium perfluorooctanesulfonate 31900-57-9,  
 Polydimethylsiloxane 37275-48-2, Bipyridyl 50314-39-1,  
 2,7-DiacetylThianthrene 56773-42-3, Tetraethylammonium  
 perfluorooctanesulfonate 114435-02-8, Fluoroethylene carbonate  
 126213-50-1, 3,4-Ethylenedioxythiophene 409071-16-5 522639-16-3  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (high voltage electrolyte)

IT 7791-03-9, Lithium perchlorate 14283-07-9,  
 Lithium tetrafluoroborate 14485-20-2, Lithium  
 tetraphenylborate 18424-17-4, Lithium  
 hexafluoroantimonate 21324-40-3, Lithium  
 hexafluorophosphate 29935-35-1, Lithium  
 hexafluoroarsenate 33454-82-9, Lithium triflate  
 90076-65-6 131651-65-5, Lithium  
 nonafluorobutanesulfonate 132404-42-3, Lithium  
 tris(trifluoromethanesulfonyl)methane 132843-44-8 244761-29-3,  
 Lithium bisoxalatoborate 338746-29-5  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (high voltage electrolyte)

DOCUMENT NUMBER: 153:339575  
 TITLE: High-voltage electrolyte with organic solvent for batteries  
 INVENTOR(S): Muldoon, John; Allred, Gary; Ankeney, Scott Michael; Matsui, Masaki; Dotse, Anthony; Sugimoto, Tsuyoshi  
 PATENT ASSIGNEE(S): Toyota Motor Engineering & Manufacturing North America, Inc., USA; Synthonix Corporation; Toyota Motor Corporation  
 SOURCE: PCT Int. Appl., 21 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010096404	A2	20100826	WO 2010-US24354	201003 09
WO 2010096404	A9	20101118		
WO 2010096404	A3	20101013		
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW RN: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA				
US 20100209780	A1	20100819	US 2009-371979	200902 17
PRIORITY APPLN. INFO.:			US 2009-371979	A 200902 17

OTHER SOURCE(S): MARPAT 153:339575  
 AB A battery that includes a cathode, anode and an electrolytic solution contains an organic electrolyte solvent having a formula R1-CO-NR2-OR3, wherein R1 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs. and perfluorinated analogs; R2 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs.; R3 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs. wherein the electrolyte is stable at voltages of greater than 4.0 V.  
 IT 110-02-1, Thiophene 827-52-1  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
 (overcharge protecting additive; high-voltage electrolyte with organic solvent for batteries)  
 RN 110-02-1 HCAPLUS  
 CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCAPLUS  
 CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M [I,S]; H01M0010-0569 [I,A]; H01M0010-0525 [I,A]; H01M0010-0567 [I,A]  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT Polyethers  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
     (perfluoro, lithium depositing additive; high-voltage electrolyte with organic solvent for batteries)  
 IT Fluoropolymers  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
     (polyether-, perfluoro, lithium depositing additive;  
     high-voltage electrolyte with organic solvent for batteries)  
 IT 57-50-1D, nitrile derivs., uses 75-52-5, uses 96-47-9 112-02-7  
 554-14-3 7446-09-5D, Sulfur dioxide, compds. 7664-39-3,  
 Hydrofluoric acid, uses 7784-23-8, Aluminum iodide (AlI<sub>3</sub>)  
 9004-34-6D, Cellulose, nitrile derivs. 29457-72-5 37349-59-0,  
 Tin iodide 56773-42-3 114435-02-8  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
     (lithium depositing additive; high-voltage electrolyte  
     with organic solvent for batteries)  
 IT 92-52-4, 1,1'-Biphenyl, uses 92-85-3, Thianthrene 96-54-8  
 100-66-3D, compds. 110-00-9, Furan 110-02-1, Thiophene  
 604-88-6 613-32-1D, derivs. 670-54-2,  
 1,1,2,2-Ethenetetracarbonitrile 778-22-3 827-52-1  
 1330-20-7, uses 6627-89-0 7323-63-9 13781-53-8,  
 3-Thiopheneacetonitrile 27215-51-6 50314-39-1 126213-50-1  
 142990-38-3 522639-16-3  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
     (overcharge protecting additive; high-voltage electrolyte with  
     organic solvent for batteries)  
 IT 358-63-4 680-31-9 872-50-4, uses 7789-24-4, Lithium  
 fluoride (LiF), uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
     (salt stabilizer; high-voltage electrolyte with organic solvent for  
     batteries)  
 IT 79-22-1 96-49-1, 1,3-Dioxolan-2-one 96-49-1D,  
 1,3-Dioxolan-2-one, halogenated 100-69-6 103-26-4 107-13-1,  
 2-Propenenitrile, uses 108-05-4, Acetic acid ethenyl ester, uses  
 108-31-6, 2,5-Furandione, uses 123-56-8, 2,5-Pyrrolidinedione

289-56-5D, Boroxin, compds. 541-59-3, 1H-Pyrrole-2,5-dione  
 872-36-6, 1,3-Dioxol-2-one 1109-15-5 1303-86-2, Boron oxide  
 (B2O3), uses 1469-70-1 4074-90-2 4427-96-7 7440-42-8D,  
 Boron, lithium salt-based compds. 13139-17-8D,  
 aromatic isocyanates 29656-58-4 31900-57-9 42557-10-8  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered  
 material use); USES (Uses)

(solid electrolyte interface forming additive; high-voltage  
 electrolyte with organic solvent for batteries)

IT 12125-02-9D, Ammonium chloride ((NH4)Cl), Tetraalkyl

RL: MOA (Modifier or additive use); TEM (Technical or engineered  
 material use); USES (Uses)

(with long alkyl chain, lithium depositing additive;  
 high-voltage electrolyte with organic solvent for batteries)

L62 ANSWER 3 OF 7 HCPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2010:1042953 HCPLUS Full-text

DOCUMENT NUMBER: 153:339470

TITLE: High-voltage electrolyte with organic solvent  
 for batteries

INVENTOR(S): Muldoon, John; Allred, Gary; Ankeny, Scott;  
 Matsui, Masaki; Dotse, Anthony; Sugimoto, Tsuyoshi

PATENT ASSIGNEE(S): Toyota Motor Engineering & Manufacturing North  
 America, Inc., USA; Synthonix Corporation;  
 Toyota Motor Corporation

SOURCE: U.S. Pat. Appl. Publ., 8pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20100209780	A1	20100819	US 2009-371979	200902 17
WO 2010096404	A2	20100826	WO 2010-US24354	201003 09
WO 2010096404	A9	20101118		
WO 2010096404	A3	20110113		

W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY,  
 BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC,  
 EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL,  
 IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS,  
 LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG,  
 NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE,  
 SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA,  
 UG, US, UZ, VC, VN, ZA, ZM, ZW  
 RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR,  
 HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO,  
 SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW,  
 ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD,  
 SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM,  
 AP, EA, EP, OA

PRIORITY APPLN. INFO.:

US 2009-371979

A

200902

- AB A battery that includes a cathode, anode and an electrolytic solution contains an organic electrolyte solvent having a formula R1-CO-NR2-OR3, wherein R1 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs. and perfluorinated analogs; R2 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs.; R3 is selected from alkanes, alkenes, alkynes, aryls and their substituted derivs. wherein the electrolyte is stable at voltages of greater than 4.0 V.
- IT 110-02-1, Thiophene 827-52-1,  
Cyclohexylbenzene  
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
(overcharge protecting additive; high-voltage electrolyte with organic solvent for batteries)
- RN 110-02-1 HCAPLUS
- CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCAPLUS  
CN Benzene, cyclohexyl- (CA INDEX NAME)



- INCL 429326000; 564209000; 429339000  
IPCI H01M0006-16 [I,A]; C07C0233-01 [I,A]  
IPCR H01M0006-16 [I,C]; H01M0006-16 [I,A]; C07C0233-00 [I,C]; C07C0233-01 [I,A]  
NCL 429/326.000; 429/339.000; 564/209.000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
IT Polyethers  
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
(perfluoro, lithium depositing additive; high-voltage electrolyte with organic solvent for batteries)
- IT Fluoropolymers  
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
(polyether-, perfluoro, lithium depositing additive;  
high-voltage electrolyte with organic solvent for batteries)
- IT 110-82-7, Cyclohexane, uses 1314-56-3, Phosphorus oxide, uses 409071-16-5, lithium difluoro(oxalato)borate  
RL: TEM (Technical or engineered material use); USES (Uses)  
(corrosion inhibitor and wetting agent; high-voltage electrolyte with organic solvent for batteries)
- IT 7791-03-9, Lithium perchlorate 14283-07-9,  
Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium

- hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6 90076-65-6, Lithium bistrifluoromethylsulfonyl imide 119229-99-1, Lithium Bis (perfluorobutanesulfonyl) imide 132404-42-3 132843-44-8, Lithium Bis (pentafluoroethanesulfonyl) imide 244761-29-3, Lithium bis(oxalato)borate  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte; high-voltage electrolyte with organic solvent for batteries)
- IT 57-50-1, Sucrose, uses 75-52-5, Nitromethane, uses 96-47-9, 2-Methyltetrahydrofuran 112-02-7, Cetyltrimethylammonium chloride 554-14-3, 2-Methylthiophene 7446-09-5D, Sulfur dioxide, compds. 7664-39-3, Hydrogenfluoride, uses 7784-23-8, Aluminum Iodide 9004-34-6D, Cellulose, nitrile derivs. 29457-72-5, Lithium perfluoroctanesulfonate 37349-59-0, Tin iodide 56773-42-3, Tetraethylammonium perfluoroctanesulfonate 114435-02-8, Fluoroethylene carbonate  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
 (lithium depositing additive; high-voltage electrolyte with organic solvent for batteries)
- IT 92-52-4, Biphenyl, uses 92-85-3, Thianthrene 96-54-8 100-66-3D, Anisole, compds. 110-00-9, Furan 110-02-1, Thiophene 604-88-6, Hexaethyl benzene 613-32-1D, Dihydrophenazine, derivs. 670-54-2, Tetracyanoethylene 778-22-3, 2,2-Diphenylpropane 827-52-1, Cyclohexylbenzene 1330-20-7, Xylene, uses 6627-89-0, Phenyl-tert-butyl carbonate 7323-63-9, 2,5-Di(tert-butyl)-1,4-dimethoxybenzene 13781-53-8, 3-Thiopheneacetonitrile 27215-51-6, Tetramethylphenylenediamine 50314-39-1, 2,7-Diacetyl thianthrene 126213-50-1, 3,4-Ethylenedioxythiophene 142990-38-3 522639-16-3  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
 (overcharge protecting additive; high-voltage electrolyte with organic solvent for batteries)
- IT 358-63-4, Tris(2,2,2-trifluoroethyl) phosphate 680-31-9, Hexamethyl-phosphoramide 872-50-4, 1-Methyl-2-pyrrolidinone, uses 7789-24-4, Lithium fluoride, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (salt stabilizer; high-voltage electrolyte with organic solvent for batteries)
- IT 79-22-1, Methyl chloroformate 96-49-1, Ethylene carbonate 96-49-1D, Ethylene carbonate, halogenated 100-69-6, 2-Vinyl pyridine 103-26-4, Methyl cinnamate 107-13-1, 2-Propenonitrile, uses 108-05-4, Vinyl acetate, uses 108-31-6, Maleic anhydride, uses 108-95-2D, Phenol, carboxyl derivs., uses 123-56-8, Succinimide 289-56-5D, Boroxine, compds. 541-59-3, Maleimide 872-36-6, Vinylene carbonate 1109-15-5, Tris(pentafluorophenyl) borane 1303-86-2, Boron trioxide, uses 1469-70-1, Allyl ethyl carbonate 4074-90-2, Divinyl adipate 4427-96-7, Vinyl ethylene carbonate 7440-42-8D, Boron, lithium salt -based compds. 13139-17-8D, N-Benzylxy carbonyloxy succinimide, aromatic isocyanates 31900-57-9, Polydimethylsiloxane  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
 (solid electrolyte interface forming additive; high-voltage electrolyte with organic solvent for batteries)
- IT 12125-02-9D, Ammonium chloride, Tetraalkyl  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered

material use); USES (Uses)  
 (with long alkyl chain, lithium depositing additive;  
 high-voltage electrolyte with organic solvent for batteries)

L62 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 20091174696 HCAPLUS Full-text  
 DOCUMENT NUMBER: 151:474416  
 TITLE: Electrolyte compatible with high-boiling-point  
 non-aqueous organic solvent and functional  
 additives for lithium manganate power  
 battery with high safety, excellent high  
 temperature property and long cycle life  
 INVENTOR(S): Li, Yongkun; Liu, Jiansheng; Yang, Chunwei;  
 Zhang, Ruoxin; Zhang, Liping  
 PATENT ASSIGNEE(S): Guangzhou Tinci Materials Technology Co., Ltd.,  
 Peop. Rep. China  
 SOURCE: Faming Zhanli Shengqing Gongkai Shuomingshu,  
 10pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
CN 101540419	A	20090923	CN 2009-10039035	200904 28
PRIORITY APPLN. INFO.:			CN 2009-10039035	200904 28

AB An electrolyte for lithium manganate power battery comprises lithium salt (lithium hexafluorophosphate, lithium tetrafluoroborate, etc.), high-boiling-point non-aqueous organic solvent, film forming additive (vinylene carbonate, 1,3-propane sultone, etc.) 0.5-5 wt%, overcharge preventing additive (thiophene, furan, etc.) 2-10 weight%, acidity and water content controlling additive (amines, alkylsilazane, etc.) 0.01-0.5 weight%, and lithium salt stabilizer (tris(2,2,2-trifluoroethyl)phosphite (TTFP), pyrimidine, etc.) 0.1-5 weight%. The non-aqueous organic solvent is selected from carbonate (ethylene carbonate, etc.) and its halogenated derivative (chloroethylene carbonate, etc.), carboxylate (Me formate, Et formate, etc.), sulfonate (ethylene sulfite or propylene sulfite), and/or phosphate (tri-Me phosphate, tri-Et phosphate, etc.). By controlling proportion of non-aqueous organic solvent and adding various functional additives, lithium manganate power battery adopting the inventive electrolyte has high safety, excellent high temperature property and long cycle life.

IT 110-02-1, Thiophene 827-52-1,  
 Cyclohexylbenzene

RL: NUU (Other use, unclassified); USES (Uses)  
 (overcharge preventing additive, electrolyte containing; Electrolyte compatible with high-boiling-point non-aqueous organic solvent and functional additives for lithium manganate power battery)

RN 110-02-1 HCAPLUS  
 CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCAPLUS  
 CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M0010-40 [I,A]; H01M0010-36 [I,C\*]  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium manganate secondary battery electrolyte org  
 solvent  
 IT Battery electrolytes  
     (Electrolyte compatible with high-boiling-point non-aqueous organic  
     solvent and functional additives for lithium manganate  
     power battery)  
 IT Secondary batteries  
     (lithium; Electrolyte compatible with  
     high-boiling-point non-aqueous organic solvent and functional additives  
     for lithium manganate power battery)  
 IT Solvents  
     (organic; Electrolyte compatible with high-boiling-point non-aqueous  
     organic solvent and functional additives for lithium  
     manganate power battery)  
 IT 109-90-0, Ethyl isocyanate  
   RL: NUU (Other use, unclassified); USES (Uses)  
     (Electrolyte compatible with high-boiling-point non-aqueous organic  
     solvent and functional additives for lithium manganate  
     power battery)  
 IT 107-15-3, Ethylenediamine, uses 141-43-5, Ethanolamine, uses  
 920-68-3, Heptamethyldisilazane 996-50-9,  
 Trimethyl-silyl-diethylamine 999-97-3, Hexamethyldisilazane  
 3088-27-5, Carbinolamine  
   RL: TEM (Technical or engineered material use); USES (Uses)  
     (acidity and water content controlling additive, electrolyte  
     containing; Electrolyte compatible with high-boiling-point non-aqueous  
     organic solvent and functional additives for lithium  
     manganate power battery)  
 IT 14283-07-9, Lithium tetrafluoroborate (LiBF<sub>4</sub>)  
 21324-40-3, Lithium hexafluorophosphate (LiPF<sub>6</sub>)  
 244761-29-3, Lithium bis(oxalato)borate 409071-16-5  
   RL: TEM (Technical or engineered material use); USES (Uses)  
     (electrolyte containing; Electrolyte compatible with  
     high-boiling-point non-aqueous organic solvent and functional additives  
     for lithium manganate power battery)  
 IT 872-36-6, Vinylene carbonate 1120-71-4, 1,3-Propane sultone  
 1633-83-6, 1,4-Butane sultone 4427-96-7, Vinyl ethylene carbonate  
   RL: NUU (Other use, unclassified); USES (Uses)  
     (film forming additive, electrolyte containing; Electrolyte  
     compatible with high-boiling-point non-aqueous organic solvent and  
     functional additives for lithium manganate power

- battery)
- IT 103-71-9, Phenyl isocyanate, uses 289-95-2, Pyrimidine  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (lithium salt stabilizer, electrolyte containing;  
 Electrolyte compatible with high-boiling-point non-aqueous organic  
 solvent and functional additives for lithium manganate  
 power battery)
- IT 78-40-0, Triethyl phosphate 79-20-9, Methyl acetate 96-49-1,  
 Ethylene carbonate 105-37-3, Ethyl propionate 105-54-4, Ethyl  
 butyrate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate  
 108-32-7, Propylene carbonate 109-60-4, Propyl acetate 109-94-4,  
 Ethyl formate 126-73-8, Tributyl phosphate, uses 141-78-6, Ethyl  
 acetate, uses 512-56-1, Trimethyl phosphate 616-38-6, Dimethyl  
 carbonate 623-42-7, Methyl butyrate 623-53-0, Methyl ethyl  
 carbonate 1469-73-4, Propylene sulfite 2463-45-8 3741-38-6,  
 Ethylene sulfite 3967-54-2, Chloroethylene carbonate 56525-42-9,  
 Methyl propyl carbonate 114435-02-8, Fluoroethylene carbonate  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (organic solvent, electrolyte containing;  
 Electrolyte compatible with high-boiling-point non-aqueous organic  
 solvent and functional additives for lithium manganate  
 power battery)
- IT 92-52-4, Biphenyl, uses 100-84-5, 3-Methylanisole 101-84-8,  
 Diphenyl ether 102-54-5, Ferrocene 104-93-8, 4-Methylanisole  
 110-00-9, Furan 110-02-1, Thiophene 132-65-0,  
 Dibenzothiophene 271-89-6, Benzofuran 321-28-8, 2-Fluoroanisole  
 352-70-5, 3-Fluorotoluene 459-60-9, 4-Fluoroanisole 578-58-5,  
 2-Methylanisole 623-12-1, 4-Chloroanisole 827-52-1,  
 Cyclohexylbenzene 1330-20-7, Xylene, uses 2845-89-8,  
 3-Chloroanisole  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (overcharge preventing additive, electrolyte containing; Electrolyte  
 compatible with high-boiling-point non-aqueous organic solvent and  
 functional additives for lithium manganate power  
 battery)

L62 ANSWER 5 OF 7 HCPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2008:1481216 HCPLUS [Full-text](#)  
 DOCUMENT NUMBER: 150:22297  
 TITLE: Non-aqueous electrolytes for lithium  
 -ion secondary batteries  
 INVENTOR(S): Lee, Ho-Chun; Jeon, Jong-Ho; Cho, Jeong-Ju  
 PATENT ASSIGNEE(S): LG Chem, Ltd., S. Korea  
 SOURCE: PCT Int. Appl., 15pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
WO 2008150134	A1	20081211	WO 2008-KR3186	200806

W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY,  
 BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE,  
 EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN,  
 IS, JP, KE, KG, KM, KN, KP, KZ, LA, LC, LK, LR, LS, LT, LU,

LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO,  
 NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL,  
 SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN,  
 ZA, ZM, ZW  
 RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR,  
 HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE,  
 SI, SK, TR, BF, BJ, CF, CI, CM, GA, GN, GQ, GW, ML, MR,  
 NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ,  
 TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 KR 2008108043 A 20081211 KR 2008-53251 200806  
 05  
 EP 2160787 A1 20100310 EP 2008-766148 200806  
 05  
 R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR,  
 HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO,  
 SE, SI, SK, TR, AL, BA, MK, RS  
 JP 2010529618 T 20100826 JP 2010-511122 200806  
 05  
 CN 101682084 A 20100324 CN 2008-80018975 200912  
 04  
 US 20100273065 A1 20101028 US 2010-663117 201007  
 06  
 PRIORITY APPLN. INFO.: KR 2007-55532 A 200706  
 07  
 WO 2008-KR3186 W 200806  
 05

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT  
 OTHER SOURCE(S): MARPAT 150:22297

AB This electrolyte consists of a Li salt and an organic solvent. The organic solvent contains a carbonate compound, a linear ester compound and a linear ester decomposition inhibitor. This nonaq. electrolyte solution inhibits swelling while improving low temperature charging/discharging characteristics of the secondary battery in comparison to a conventional electrolyte, since it contains the linear ester compound and the linear ester decomposition inhibitor. The nonaq. electrolyte solution may be used in making a Li-ion secondary battery.  
 IT 110-02-1, Thiophene 110-02-1D, Thiophene, halogenated 827-52-1, Cyclohexyl benzene 827-52-1D, Cyclohexyl benzene, halogenated  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
 (non-aqueous electrolytes for lithium-ion secondary batteries)  
 RN 110-02-1 HCAPLUS  
 CN Thiophene (CA INDEX NAME)



RN 110-02-1 HCAPLUS  
 CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCAPLUS  
 CN Benzene, cyclohexyl- (CA INDEX NAME)



RN 827-52-1 HCAPLUS  
 CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M0010-40 [I,A]; H01M0010-36 [I,C\*]  
 IPCR H01M0010-00 [I,C\*]; H01M0010-0525 [I,A]; H01M0010-0567 [I,A];  
     H01M0010-0569 [I,A]; H01M0010-36 [I,C\*]; H01M0010-36 [I,A]  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 21  
 ST nonaq electrolyte lithium ion secondary battery  
 IT Polysiloxanes  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered  
     material use); USES (Uses)  
     (derivs.; non-aqueous electrolytes for lithium-ion  
     secondary batteries)  
 IT Secondary batteries  
     (lithium; non-aqueous electrolytes for lithium  
     -ion secondary batteries)  
 IT Battery electrolytes  
     (non-aqueous electrolytes for lithium-ion secondary  
     batteries)  
 IT 62-53-3, Aniline, uses 62-53-3D, Aniline, halogenated 92-52-4,  
     Biphenyl, uses 92-52-4D, Biphenyl, halogenated 96-48-0,  
      $\gamma$ -Butyrolactone 96-48-0D,  $\gamma$ -Butyrolactone, halogenated  
     108-29-2,  $\gamma$ -Valerolactone 108-29-2D,  $\gamma$ -Valerolactone,  
     halogenated 109-74-0, Butyronitrile 109-74-0D, Butyronitrile,  
     halogenated 109-97-7, Pyrrole 109-97-7D, Pyrrole, halogenated  
     110-02-1, Thiophene 110-02-1D, Thiophene,  
     halogenated 110-59-8, Valeronitrile 110-59-8D, Valeronitrile,  
     halogenated 110-61-2, Succinonitrile 110-61-2D, Succinonitrile,  
     halogenated 111-69-3, Adiponitrile 111-69-3D, Adiponitrile,  
     halogenated 358-63-4 358-63-4D, halogenated 628-73-9,  
     Hexanenitrile 628-73-9D, Hexanenitrile, halogenated

827-52-1, Cyclohexyl benzene 827-52-1D,  
 Cyclohexyl benzene, halogenated 7803-62-5, Silane, uses  
 7803-62-5D, Silane, halogenated 25496-08-6, Fluoro toluene  
 25496-08-6D, Fluoro toluene, halogenated  
 RL: MOA (Modifier or additive use); TEM (Technical or engineered  
 material use); USES (Uses)  
 (non-aqueous electrolytes for lithium-ion secondary  
 batteries)

IT 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8,  
 Diethyl carbonate 106-36-5, Propyl propionate 108-32-7,  
 Propylene carbonate 554-12-1, Methyl propionate 590-01-2, Butyl  
 propionate 616-38-6, Dimethyl carbonate 623-53-0, Methyl ethyl  
 carbonate 4437-85-8, Butylene carbonate 7791-03-9,  
 Lithium perchlorate (LiClO<sub>4</sub>) 14283-07-9 18424-17-4,  
 Lithium hexafluorophosphate (LiPF<sub>6</sub>) 29935-35-1, Lithium  
 hexafluoro arsenate (LiAsF<sub>6</sub>) 33454-82-9, Lithium  
 triflate 35363-40-7, Ethyl propyl carbonate 56525-42-9, Methyl  
 propyl carbonate 90076-65-6 114435-02-8 132404-42-3  
 132843-44-8  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (non-aqueous electrolytes for lithium-ion secondary  
 batteries)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L62 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 20061689399 HCAPLUS Full-text  
 DOCUMENT NUMBER: 145:127638  
 TITLE: Nonaqueous electrolyte solution for  
 lithium secondary batteries  
 INVENTOR(S): Ahn, Sun Ho; Cho, Jeong Ju; Kim, Hyeong Jin;  
 Lee, Han Ho; Lee, Ho Chun; Lee, Jae Heon; Son,  
 Mi Yeong  
 PATENT ASSIGNEE(S): Lg Chem. Ltd., S. Korea  
 SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given  
 CODEN: KRXXA7  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Korean  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
KR 2004023870	A	20040320	KR 2002-55309	200209 12
PRIORITY APPLN. INFO.:			KR 2002-55309	200209 12

AB In this Li battery with a nonaq. electrolyte solution overcharge current is  
 blocked through polymerization of electrolyte components by degradation due to  
 oxidation, thereby improving safety. The nonaq. electrolyte solution  
 comprises a Li salt, an electrolyte solution compound, 0.5-5% of a  
 nonconductive polymer monomer, and 0.1-2% of a conductive polymer monomer.  
 Preferably the nonconductive polymer monomer is cyclohexylbenzene,  
 isopropylbenzene or 5-butylbenzene; and the conductive polymer monomer is

biphenyl, 1-phenyl-1-cyclohexane or benzofuran. The Li secondary battery comprises a cathode, an anode, a porous separator, and the nonaq. electrolyte solution

IT 92-52-4, Biphenyl, uses 98-82-8,

Isopropylbenzene

RL: DEV (Device component use); USES (Uses)  
(electrolyte containing; nonaq. electrolyte solution  
for lithium secondary batteries with safety feature)

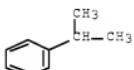
RN 92-52-4 HCPLUS

CN 1,1'-Biphenyl (CA INDEX NAME)



RN 98-82-8 HCPLUS

CN Benzene, (1-methylethyl)- (CA INDEX NAME)



IPCI H01M0010-40 [ICM,7]; H01M0010-36 [ICM,7,C\*]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium secondary battery nonaq electrolyte safety

IT Secondary batteries  
(lithium; nonaq. electrolyte solution for lithium  
secondary batteries with safety feature)

IT Battery electrolytes

Safety  
(nonaq. electrolyte solution for lithium secondary  
batteries with safety feature)

IT 92-52-4, Biphenyl, uses 98-82-8,

Isopropylbenzene 135-98-8 271-89-6, Benzofuran 827-52-1

RL: DEV (Device component use); USES (Uses)  
(electrolyte containing; nonaq. electrolyte solution  
for lithium secondary batteries with safety feature)

L62 ANSWER 7 OF 7 HCPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2002:773833 HCPLUS Full-text

DOCUMENT NUMBER: 137:303358

TITLE: Secondary power source and its manufacture

INVENTOR(S): Kuruma, Isamu; Morimoto, Takeshi; Tsushima,  
Manabu

PATENT ASSIGNEE(S): Japan Carlit Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

## 10/588481

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002298849	A	20021011	JP 2001-103633	200104 02
WO 2002082568	A1	20021017	WO 2002-JP3305	200204 02

W: CN, US  
 RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
 NL, PT, SE, TR

PRIORITY APPLN. INFO.: JP 2001-103633 A 200104  
02

AB The power source has an activated C pos. electrode, a neg. electrode of graphitic carbonaceous material, having d002 0.334-0.337 nm, coated with a low crystallinity carbonaceous material, and an electrolyte solution containing a Li salt dissolved in an organic solvent. The power source is prepared by contacting the graphitic material with an organic vapor, and pyrolyzing the vapor to form the low crystallinity coating.

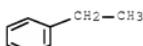
IT 100-41-4, Ethylbenzene, processes 100-42-5,

Styrene, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (in manufacture of graphitic carbon with low crystallinity  
 carbonaceous coatings for neg. electrodes for secondary power  
 source)

RN 100-41-4 HCPLUS

CN Benzene, ethyl- (CA INDEX NAME)



RN 100-42-5 HCPLUS

CN Benzene, ethenyl- (CA INDEX NAME)



IPCI H01M0004-58 [ICM,7]; C01B0031-04 [ICS,7]; C01B0031-00 [ICS,7,C\*];  
 C23C0016-26 [ICS,7]; H01G0009-058 [ICS,7]; H01G0009-038 [ICS,7];  
 H01G0009-022 [ICS,7,C\*]; H01M0004-02 [ICS,7]; H01M0010-40 [ICS,7];  
 H01M0010-36 [ICS,7,C\*]

IPCR C01B0031-00 [I,C\*]; C01B0031-04 [I,A]; C23C0016-26 [I,C\*];  
 C23C0016-26 [I,A]; H01G0009-022 [I,C\*]; H01G0009-038 [I,A];  
 H01G0009-058 [I,C\*]; H01G0009-058 [I,A]; H01M0004-02 [I,C\*];  
 H01M0004-02 [I,A]; H01M0004-36 [N,C\*]; H01M0004-36 [N,A];  
 H01M0004-58 [I,C\*]; H01M0004-58 [I,A]; H01M0010-36 [I,C\*];  
 H01M0010-40 [I,A]

CC 76-10 (Electric Phenomena)  
 Section cross-reference(s): 52

ST secondary power source lithium salt

electrolyte carbon electrode; activated carbon pos electrode  
secondary power source; graphitic carbonaceous neg electrode  
secondary power source manuf

IT Capacitors  
 (double layer; secondary power source containing activated carbon pos  
electrodes and graphitic carbon neg. electrodes and  
lithium salt electrolytes)

IT Carbonaceous materials (technological products)  
 RL: DEV (Device component use); USES (Uses)  
 (graphitized; secondary power source containing activated carbon pos  
electrodes and graphitic carbon neg. electrodes and  
lithium salt electrolytes)

IT Secondary batteries  
 (lithium; secondary power source containing activated carbon pos  
electrodes and graphitic carbon neg. electrodes and  
lithium salt electrolytes)

IT Carbonaceous materials (technological products)  
 RL: DEV (Device component use); USES (Uses)  
 (secondary power source containing activated carbon pos electrodes  
and graphitic carbon neg. electrodes and lithium  
salt electrolytes)

IT 7440-44-0, Carbon, uses  
 RL: DEV (Device component use); USES (Uses)  
 (activated; secondary power source containing activated carbon pos  
electrodes and graphitic carbon neg. electrodes and  
lithium salt electrolytes)

IT 71-43-2, Benzene, processes 74-82-8, Methane, processes 74-84-0,  
 Ethane, processes 74-85-1, Ethylene, processes 74-86-2,  
 Acetylene, processes 74-98-6, Propane, processes 91-20-3,  
 Naphthalene, processes 98-95-3, Nitrobenzene, processes  
 100-41-4, Ethylbenzene, processes 100-42-5,  
 Styrene, processes 106-97-8, Butane, processes 108-88-3,  
 Toluene, processes 108-90-7, Chlorobenzene, processes 109-66-0,  
 Pentane, processes 1330-20-7, Xylene, processes  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); PROC (Process)  
 (in manufacture of graphitic carbon with low crystallinity  
 carbonaceous coatings for neg. electrodes for secondary power  
 source)

OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS  
 RECORD (3 CITINGS)

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=> d que stat 161
L4          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON BIPHENYL/CN
L5          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON ISOPROPYLBENZEN
E/CN
L6          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON VINYLBENZENE/CN
L7          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON ETHYLBENZENE/CN
L8          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON TOLUENE/CN
L9          1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON T-BUTYLBENZENE/
CN
L12         1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON THIOPHENE/CN
L13         1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON CYCLOHEXYLBENZE
NE/CN
L16         47196 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L4
L17         13306 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L5
L18         81745 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L6
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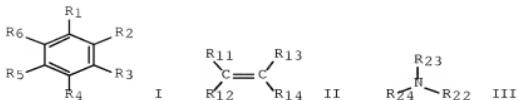
L19        32688 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L7  
 L20        115160 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8  
 L21        3436 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L9  
 L24        14762 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L12  
 L25        1834 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L13  
 L28        QUE SPE=ON ABB=ON PLU=ON (LI OR LITHIUM) (A) SALT  
 L29        QUE SPE=ON ABB=ON PLU=ON ELECTROLY?  
 L30        QUE SPE=ON ABB=ON PLU=ON ELECTROLY? (A) (SOLVENT OR SOL  
             UTION)  
 L31        799 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L16 AND L17  
 L32        11 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L31 AND L29  
 L33        2 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L32 AND L28  
 L34        8046 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L18 AND L19  
 L35        44 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L34 AND L29  
 L36        2 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L35 AND L28  
 L37        QUE SPE=ON ABB=ON PLU=ON LI OR LITHIUM  
 L38        4 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L35 AND L37  
 L39        QUE SPE=ON ABB=ON PLU=ON BATTERY  
 L40        4 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L35 AND L39  
 L41        4 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L36 OR L38 OR  
             L40  
 L42        6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L32 AND L37  
 L43        6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L32 AND L39  
 L44        7 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L33 OR (L42 OR  
             L43)  
 L45        1951 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L20 AND L21  
 L46        27 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L45 AND L29  
 L47        1 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L46 AND L28  
 L48        6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L46 AND L39  
 L49        7 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L46 AND L37  
 L50        8 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L48 OR L49  
 L52        49 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L24 AND L25  
 L53        12 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L52 AND L37  
 L54        6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L53 AND L28  
 L55        10 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L52 AND L39  
 L57        10 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L53 AND L55  
 L58        6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L54 AND L30  
 L60        8 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L36 OR L47 OR  
             L58 OR L33  
 L61        16 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON (L41 OR L44 OR  
             L50 OR L57) NOT L60

=> d ibib abs hitstr hitind l61 1-16

L61 ANSWER 1 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2010:169650 HCAPLUS Full-text  
 DOCUMENT NUMBER: 152:243759  
 TITLE: Secondary nonaqueous electrolyte  
          batteries and devices using the  
          batteries  
 INVENTOR(S): Watanabe, Shoichiro; Iwamoto, Kazuya; Ueda,  
             Atsushi; Nunome, Jun; Koshina, Hizuru  
 PATENT ASSIGNEE(S): Panasonic Corporation, Japan  
 SOURCE: Jpn. Tokkyo Koho, 16pp.; Chemical Indexing  
          Equivalent to 134:103242 (WO)  
 CODEN: JTXXFF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 2

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 4411691	B2	20100210	JP 1999-184931	199906 30
JP 2001015158	A	20010119		
WO 2001003226	A1	20010111	WO 2000-JP4291	200006 29
EP 1215745	A1	20020619	EP 2000-940876	200006 29
CN 1190864	C	20050223	CN 2000-806979	200006 29
JP 2002050398	A	20020215	JP 2001-166615	200106 01
JP 3633510	B2	20050330		
KR 2007037749	A	20070406	KR 2007-7005770	200703 13
US 20080014496	A1	20080117	US 2007-780317	200707 19
JP 2010027616	A	20100204	JP 2009-229435	200910 01
PRIORITY APPLN. INFO.:			JP 1999-184931	A 199906 30
			WO 2000-JP4291	W 200006 29
			US 2001-959429	A1 200110 25
			KR 2001-7013915	A3 200110 30



AB The batteries have Li containing multiple oxide cathodes, Li intercalating anodes, and a nonaq. electrolyte solution in a solvent containing  $\geq 1$  organic compound, which has HOMO energy -8.5 to -11.0 eV and LUMO energy -0.135 to 3.5 eV. The compound is preferably a benzene derivative I (R1-6 = H alkyl, aryl, or amino groups, but not all R's being H; and neighboring alkyl groups may join together to form a 5- or 6-membered ring); a substituted ethylene II (R11-14 = H, alkyl, alkoxy, aryl, or oxy carbonyl R15OCO group; and alkyl substituents on the same C atom may joined together to form a 5- or 6-membered ring); or an amine derivative III (R21-23 = alkyl or aryl groups). The devices may be elec. or electronic devices.

IT 110-02-1, Thiophene 827-52-1

RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(electrolyte solns. containing organic compound having controlled HOMO and LUMO energy for secondary lithium batteries)

RN 110-02-1 HCPLUS

CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCPLUS

CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M0010-0567 [I,A]; H01M0010-0569 [I,A]; H01M0010-0525 [I,A];  
H01M0010-0564 [I,A]; H01M0010-0587 [I,A]; H01M0002-34 [I,A];  
H01M0002-20 [I,C\*]

IPCR H01M0010-00 [I,C]; H01M0010-0567 [I,A]; H01M0002-20 [I,C];  
H01M0002-34 [I,A]; H01M0006-00 [N,C\*]; H01M0006-04 [N,C\*];  
H01M0006-10 [N,A]; H01M0006-50 [N,A]; H01M0010-0525 [I,A];  
H01M0010-0564 [I,A]; H01M0010-0569 [I,A]; H01M0010-0587 [I,A];  
H01M0010-36 [I,C\*]; H01M0010-40 [I,A]; H01M0010-42 [N,C\*];  
H01M0010-42 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary lithium battery electrolyte solvent

org compd

IT Battery electrolytes

(electrolyte solns. containing organic compound having controlled HOMO and LUMO energy for secondary lithium batteries)

IT 77-73-6 80-62-6 91-21-4 91-73-6 92-52-4, 1,1'-Biphenyl, uses

92-54-6 92-94-4, 1,1':4'',1'''-Terphenyl 110-02-1,  
 Thiophene 111-02-4 477-75-8 513-81-5 612-71-5 613-31-0  
 620-40-6 695-12-5 764-99-8 827-52-1 855-38-9  
 926-02-3 992-04-1 1087-02-1 1192-37-6 1321-74-0, uses  
 1610-39-5 1633-22-3 7785-70-8 17249-80-8 18794-84-8  
 RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
 (electrolyte solns. containing organic compound having controlled HOMO and  
 LUMO energy for secondary lithium batteries)

IT 96-49-1, 1,3-Dioxolan-2-one 105-58-8 21324-40-3 51013-18-4

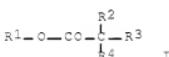
RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte solns. containing organic compound having controlled HOMO and  
 LUMO energy for secondary lithium batteries)

OS.CITING REF COUNT: 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS  
 RECORD (7 CITINGS)

L61 ANSWER 2 OF 16 HCPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2009:796668 HCPLUS Full-text  
 DOCUMENT NUMBER: 151:128553  
 TITLE: Nonaqueous electrolyte secondary  
 battery  
 INVENTOR(S): Takahashi, Kentaro  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: U.S. Pat. Appl. Publ., 8pp.  
 CODEN: USXKC0  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20090170007	A1	20090702	US 2008-342667	200812 23
JP 2009163937	A	20090723	JP 2007-340514	200712 28
CN 101471459	A	20090701	CN 2008-10190203	200812 26
PRIORITY APPLN. INFO.:			JP 2007-340514	A 200712 28

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT  
 OTHER SOURCE(S): MARPAT 151:128553  
 GI



AB A non-aqueous electrolyte secondary cell is provided having enhanced safety against overcharge and reduced self-discharge. The non-aqueous electrolyte secondary cell includes: a pos. electrode having a pos. electrode active

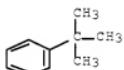
material; a neg. electrode having a neg. electrode active material; and a non-aqueous electrolyte containing a non-aqueous solvent and electrolytic salt. The non-aqueous solvent contains 20 to 80 volume% tertiary carboxylic acid ester represented by formula (I) at 25° and 1 atmospheric. The non-aqueous electrolyte contains an alkylbenzene compound and/or a halogenated benzene compound where R1 to R4 each denote a straight-chained or branched alkyl group having 4 or less carbon atoms and may be the same or different.

IT 98-06-6, tert-Butylbenzene 108-88-3, Toluene,  
uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(nonaq. electrolyte secondary battery)

RN 98-06-6 HCPLUS

CN Benzene, (1,1-dimethylethyl)- (CA INDEX NAME)



RN 108-88-3 HCPLUS

CN Benzene, methyl- (CA INDEX NAME)



INCL 429343000

IPCI H01M0010-00 [I,A]

IPCR H01M0010-00 [I,C]; H01M0010-00 [I,A]

NCL 429/343.000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary battery safety

IT Carboxylic acids

RL: TEM (Technical or engineered material use); USES (Uses)  
(esters, tertiary; nonaq. electrolyte secondary  
battery)

IT Battery electrolytes

Secondary batteries  
(nonaq. electrolyte secondary battery)

IT 71-43-2D, Benzene, alkyl derivative 71-43-2D, Benzene, halogenated  
96-49-1, Ethylene carbonate 98-06-6, tert-Butylbenzene

100-41-4, Ethylbenzene, uses 104-51-8, n-Butylbenzene

108-88-3, Toluene, uses 108-90-7, Chlorobenzene, uses

321-28-8, 2-Fluoroanisole 372-18-9, 1,3-Difluorobenzene

372-38-3, 1,3,5-Trifluorobenzene 452-10-8, 2,4-Difluoroanisole

456-49-5, 3-Fluoroanisole 462-06-6, Fluorobenzene 598-98-1,

Methyl trimethyl acetate 827-52-1, Cyclohexylbenzene 2049-95-8,  
tert-Amylbenzene 3938-95-2, Ethyl trimethyl acetate 93343-10-3,  
3,5-Difluoroanisole 1166834-84-9

RL: TEM (Technical or engineered material use); USES (Uses)  
(nonaq. electrolyte secondary battery)

ACCESSION NUMBER: 2009:146058 HCPLUS Full-text  
 DOCUMENT NUMBER: 150:218258  
 TITLE: Swelling inhibition in batteries  
 INVENTOR(S): Mikhaylik, Yuriy V.; Kovalev, Igor  
 PATENT ASSIGNEE(S): Sion Power Corporation, USA  
 SOURCE: U.S. Pat. Appl. Publ., 12pp.; Chemical Indexing  
 Equivalent to 150:218253 (WO)  
 CODEN: USXXCO

DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20090035646	A1	20090205	US 2007-888339	200707 31
WO 2009017726	A1	20090205	WO 2008-US9158	200807 29
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RN: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
PRIORITY APPLN. INFO.: US 2007-888339			A	200707 31

## ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

- AB The present invention relates generally to electrochem. cells, and more specifically, to additives for electrochem. cells which may enhance the performance of the cell. In some cases, the additive may advantageously interact with at least one component or species of the cell to increase the efficiency and/or lifetime of the cell. The incorporation of certain additives within the electrolyte of the cell may improve the cycling lifetime and/or performance of the cell.
- IT 100-41-4, Ethylbenzene, uses 100-42-5,  
Styrene, uses
- RL: MOA (Modifier or additive use); USES (Uses)  
(swelling inhibition in batteries)
- RN 100-41-4 HCPLUS
- CN Benzene, ethyl- (CA INDEX NAME)



RN 100-42-5 HCAPLUS  
 CN Benzene, ethenyl- (CA INDEX NAME)



INCL 429050000; 429163000; 429188000  
 IPCI H01M0006-14 [I,A]  
 IPCR H01M0006-14 [I,C]; H01M0006-14 [I,A]  
 NCL 429/050.000; 429/163.000; 429/188.000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST battery swelling inhibition  
 IT Swelling, physical  
     (prevention; swelling inhibition in batteries)  
 IT Alkenes  
 Alkynes  
   RL: MOA (Modifier or additive use); USES (Uses)  
     (substituted; swelling inhibition in batteries)  
 IT Battery electrolytes  
 Secondary batteries  
     (swelling inhibition in batteries)  
 IT 91-16-7, 1,2-Dimethoxybenzene 91-20-3, Naphthalene, uses  
 95-47-6, o-Xylene, uses 98-08-8, Trifluoromethylbenzene 98-82-8,  
 Isopropylbenzene 100-41-4, Ethylbenzene, uses  
 100-42-5, Styrene, uses 100-66-3, Methoxybenzene, uses  
 100-69-6, 2-Vinylpyridine 103-73-1, Ethoxybenzene 104-93-8,  
 4-Methylanisole 108-38-3, m-Xylene, uses 108-48-5, 2,6-Lutidine  
 110-86-1, Pyridine, uses 150-78-7, 1,4-Dimethoxybenzene  
 151-10-0, 1,3-Dimethoxybenzene 230-07-9, 4,7-Phenanthroline  
 290-37-9, Pyrazine 366-18-7, 2,2'-Dipyridine 501-65-5,  
 Diphenylacetylene 538-86-3, Methylbenzyl ether 543-53-3,  
 Pyridinium nitrate 637-69-4, 4-Methoxystyrene 645-05-6,  
 Hexamethylmelamine 1321-74-0, Divinylbenzene, uses 1942-45-6,  
 4-Octyne 20734-58-1, 1,8-Bis(dimethylamino)naphthalene  
 24057-28-1, Pyridinium p-toluenesulfonate 52193-54-1, Pyridinium  
 triflate 84752-61-4, Pyridine 3-nitrobenzenesulfonate  
 165960-71-4, Pyridine, 2,6-dimethyl-, nitrate 917369-34-7  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (swelling inhibition in batteries)  
 IT 110-71-4, 1,2-Dimethoxyethane 646-06-0, 1,3-Dioxolane 7439-93-2,  
 Lithium, uses 7790-69-4, Lithium nitrate  
 9003-47-8, Polyvinylpyridine 26222-40-2, Styrene/4-vinylpyridine  
 copolymer 90076-65-6, Lithium  
 bis(trifluoromethanesulfoneimide)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
     (swelling inhibition in batteries)

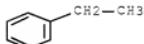
L61 ANSWER 4 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2009:140215 HCAPLUS Full-text  
 DOCUMENT NUMBER: 150:218253  
 TITLE: Swelling inhibition in batteries  
 INVENTOR(S): Mikhaylik, Yuriy V.; Kovalev, Igor  
 PATENT ASSIGNEE(S): Sion Power Corporation, USA  
 SOURCE: PCT Int. Appl., 31pp.; Chemical Indexing  
         Equivalent to 150:218258 (US)  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent

LANGUAGE : English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2009017726	A1	20090205	WO 2008-US9158	200807 29
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SI, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
US 20090035646	A1	20090205	US 2007-888339	200707 31
PRIORITY APPLN. INFO.:				US 2007-888339 A 200707 31

## ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present invention relates generally to electrochem. cells, and more specifically, to additives for electrochem. cells which may enhance the performance of the cell. In some cases, the additive may advantageously interact with at least one component or species of the cell to increase the efficiency and/or lifetime of the cell. The incorporation of certain additives within the electrolyte of the cell may improve the cycling lifetime and/or performance of the cell.  
 IT 100-41-4, uses 100-42-5, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (swelling inhibition in batteries)  
 RN 100-41-4 HCPLUS  
 CN Benzene, ethyl- (CA INDEX NAME)



RN 100-42-5 HCPLUS  
 CN Benzene, ethenyl- (CA INDEX NAME)



10/588481

IPCR H01M0004-62 [I,C]; H01M0004-62 [I,A]; H01M0010-42 [I,C]; H01M0010-44 [I,A]  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST battery swelling inhibition  
 IT Secondary batteries  
     (lithium; swelling inhibition in batteries)  
 IT Swelling, physical  
     (prevention; swelling inhibition in batteries)  
 IT Alkenes  
 Alkynes  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (substituted; swelling inhibition in batteries)  
 IT Battery electrolytes  
     (swelling inhibition in batteries)  
 IT 91-16-7 91-20-3, Naphthalene, uses 95-47-6, uses 98-08-8  
 98-82-8 100-41-4, uses 100-42-5, uses  
 100-66-3, uses 100-69-6 103-73-1 104-93-8 108-38-3, uses  
 108-48-5 110-86-1, Pyridine, uses 150-78-7 151-10-0  
 230-07-9, 4,7-Phenanthroline 290-37-9, Pyrazine 366-18-7,  
 2,2'-Bipyridine 501-65-5 538-86-3 543-53-3 637-69-4  
 645-05-6 1321-74-0, uses 1942-45-6, 4-Octyne 20734-58-1  
 24057-28-1 52193-54-1 84752-61-4 165960-71-4 917369-34-7  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (swelling inhibition in batteries)  
 IT 110-71-4 646-06-0, 1,3-Dioxolane 7439-93-2, Lithium,  
 uses 7790-69-4 9003-47-8 26222-40-2 90076-65-6  
 RL: TEM (Technical or engineered material use); USES (Uses)  
     (swelling inhibition in batteries)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L61 ANSWER 5 OF 16 HCPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2007:793705 HCPLUS [Full-text](#)  
 DOCUMENT NUMBER: 147:193049  
 TITLE: Additives for nonaqueous electrolyte  
       and lithium secondary battery  
       using the same  
 INVENTOR(S): Lee, Ho Chun; Shin, Sun Sik; Park, Hong Kyu;  
                   Jeon, Joo Mi; Cho, Jeong Ju  
 PATENT ASSIGNEE(S): Lg Chem, Ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 8 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20070166609	A1	20070719	US 2007-623845	200701 17
KR 2007076522	A	20070724	KR 2007-5085	200701 17
KR 789107	B1	20071226		
WO 2007083917	A1	20070726	WO 2007-KR276	200701

W:	AB, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, ZA, ZM, ZW	17		
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
EP 1979979	A1	20081015	EP 2007-708501	
				200701 17
R:	DE, FR, GB, SE			
CN 101375459	A	20090225	CN 2007-80003300	
				200701 17
CN 101375459	B	20101027	KR 2006-5058	A
PRIORITY APPLN. INFO.:				200601 17
				WO 2007-KR276 W
				200701 17

## ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

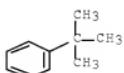
AB Disclosed is an electrolyte for batteries, comprising: (a) an electrolyte salt; (b) an organic solvent; (c) a first compound having an oxidation initiation voltage (vs. Li/Li<sup>+</sup>) higher than the operating voltage of a cathode; and (d) a second reversible compound having an oxidation initiation voltage higher than the operating voltage of the cathode, but lower than the oxidation initiation voltage of the first compound. Also disclosed is a lithium secondary battery comprising the electrolyte. In the lithium secondary battery, two compds. having different safety improvement actions at a voltage higher than the operating voltage of the cathode are used in combination as electrolyte components. Thus, the safety of the secondary battery in an overcharged state can be ensured, and at the same time, the deterioration of the battery can be prevented from occurring when it is repeatedly cycled, continuously charged and stored at high temperature for a long time.

IT 98-06-6, tert-Butylbenzene 108-88-3, Toluene,  
uses

RL: MOA (Modifier or additive use); USES (Uses)  
(additives for nonaq. electrolyte of lithium  
secondary battery)

RN 98-06-6 HCPLUS

CN Benzene, (1,1-dimethylethyl)- (CA INDEX NAME)



RN 108-88-3 HCPLUS

CN Benzene, methyl- (CA INDEX NAME)



INCL 429105000; 429324000; 429200000; 429326000  
 IPCI H01M0008-20 [I,A]; H01M0010-40 [I,A]  
 IPCR H01M0008-20 [I,C]; H01M0008-20 [I,A]; H01M0010-00 [I,C\*];  
 H01M0010-0525 [I,A]; H01M0010-0567 [I,A]; H01M0010-36 [I,C\*];  
 H01M0010-36 [I,A]  
 NCL 429/105.000; 429/200.000; 429/324.000; 429/326.000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST electrolyte additive lithium secondary  
 battery; safety electrolyte additive  
 lithium secondary battery  
 IT Battery electrolytes  
 Safety  
 (additives for nonaq. electrolyte of lithium  
 secondary battery)  
 IT Secondary batteries  
 (lithium; additives for nonaq. electrolyte of  
 lithium secondary battery)  
 IT 92-52-4, Biphenyl, uses 98-06-6, tert-Butylbenzene  
 100-66-3D, Anisole, derivs. 104-51-8, Butylbenzene  
 108-88-3, Toluene, uses 827-52-1, Cyclohexylbenzene  
 1743-87-9 2049-95-8, tert-Amylbenzene 25496-07-5, Fluorobiphenyl  
 25496-08-6, Fluorotoluene 31424-56-3, Di(tert-Butylbenzene)  
 96141-26-3, DiBromodimethoxybenzene 522639-16-3 847567-67-3  
 944257-03-8 944257-05-0 944257-07-2  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (additives for nonaq. electrolyte of lithium  
 secondary battery)  
 IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate  
 21324-40-3, Lithium hexafluorophosphate  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (additives for nonaq. electrolyte of lithium  
 secondary battery)

L61 ANSWER 6 OF 16 HCPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2006:1065902 HCPLUS Full-text  
 DOCUMENT NUMBER: 145:400980  
 TITLE: Electrolyte solutions for secondary  
 batteries and secondary  
 batteries  
 INVENTOR(S): Ishikawa, Hitoshi; Utsuki, Koji; Kusachi, Yuki  
 PATENT ASSIGNEE(S): Nec Corp., Japan  
 SOURCE: Jpn. Kokai Tokyo Koho, 39pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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10/588481

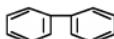
JP 2006278106	A	20061012	JP 2005-94513	200503 29
PRIORITY APPLN. INFO.:			JP 2005-94513	200503 29

OTHER SOURCE(S): MARPAT 145:400980

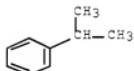
AB The solution contains (A) electrolyte salt, (B) aprotic solvent, (C) compound which polymerizes, decomp. with emission of gases, or are redox reactive under a voltage equal or above the maximum battery driving voltage, e.g. (partially hydrogenated) biphenyl, cyclobenzylhexyl, di-Ph ether, and (D) R3SO2CR1R4SO2R2 (R1, R4 = H, (un)substituted C1-5 alkyl, alkoxy, or fluoroalkyl, C1-5 polyfluoroalkyl, SO2X1; SY1, COZ, halogen; R2, R3 (un)substituted C1-5 alkyl, alkoxy, or fluoroalkyl, (un)substituted phenoxy, C1-5 polyfluoroalkyl, C1-5 polyfluoroalkoxy, OH, halo, NX2X3, NY2CONY3Y4; X1, Y1 = (un)substituted C1-5 alkyl; X2, X3, Y2-4, Z = H (un)substituted C1-5 alkyl). The solution may also contain cyclic mono- or disulfonic acid esters (given in Markush). Secondary batteries using the electrolyte solns. are also claimed. The batteries may be packed in laminates. The batteries are safe even when over-charged.

IT 92-52-4, Biphenyl, uses 98-82-8, Cumene  
 110-02-1, Thiophene 827-52-1, Cyclohexylbenzene  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte solns. containing disulfonylmethanes for secondary batteries with overcharging safety)

RN 92-52-4 HCPLUS  
 CN 1,1'-Biphenyl (CA INDEX NAME)



RN 98-82-8 HCPLUS  
 CN Benzene, (1-methylethyl)- (CA INDEX NAME)



RN 110-02-1 HCPLUS  
 CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCPLUS  
 CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M0010-40 [I,A]; H01M0010-36 [I,C\*]; H01M0002-02 [I,A];  
     H01M0004-02 [I,A]; H01M0004-38 [I,A]; H01M0004-58 [I,A]  
 IPCR H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0002-02 [I,C]; H01M0002-02  
     [I,A]; H01M0004-02 [I,C]; H01M0004-02 [I,A]; H01M0004-38 [I,C];  
     H01M0004-38 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary battery disulfonylmethane deriv  
     electrolyte additive; overcharging safety secondary  
     battery sulfonylmethane additive electrolyte;  
     cyclin sulfone secondary battery electrolyte  
     additive  
 IT Solvents  
     (aprotic; electrolyte solns. containing disulfonylmethanes  
     for secondary batteries with overcharging safety)  
 IT Ethers, uses  
     RL: DEV (Device component use); TEM (Technical or engineered  
         material use); USES (Uses)  
         (cyclic, (fluorinated); electrolyte solns. containing  
         disulfonylmethanes for secondary batteries with  
         overcharging safety)  
 IT Carbonates, uses  
     RL: DEV (Device component use); TEM (Technical or engineered  
         material use); USES (Uses)  
         (cyclic, linear, fluorinated, solvent; electrolyte  
         solns. containing disulfonylmethanes for secondary batteries  
         with overcharging safety)  
 IT Battery electrolytes  
     Secondary batteries  
         (electrolyte solns. containing disulfonylmethanes for  
         secondary batteries with overcharging safety)  
 IT Ethers, uses  
     RL: DEV (Device component use); TEM (Technical or engineered  
         material use); USES (Uses)  
         (electrolyte solns. containing disulfonylmethanes for  
         secondary batteries with overcharging safety)  
 IT Fatty acids, uses  
     RL: DEV (Device component use); TEM (Technical or engineered  
         material use); USES (Uses)  
         (esters, (fluorinated); electrolyte solns. containing  
         disulfonylmethanes for secondary batteries with  
         overcharging safety)  
 IT Ethers, uses  
     RL: DEV (Device component use); TEM (Technical or engineered  
         material use); USES (Uses)  
         (fluoroalkyl; electrolyte solns. containing  
         disulfonylmethanes for secondary batteries with  
         overcharging safety)  
 IT Lactones  
     RL: DEV (Device component use); TEM (Technical or engineered  
         material use); USES (Uses)  
         ( $\gamma$ , (fluorinated); electrolyte solns. containing  
         disulfonylmethanes for secondary batteries with

overcharging safety)

IT 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses  
7782-42-5, Graphite, uses  
RL: DEV (Device component use); USES (Uses)  
(anode active material; electrolyte solns. containing disulfonylmethanes for secondary batteries with overcharging safety)

IT 12057-17-9, Lithium manganese oxide (LiMn2O4)  
12190-79-3, Cobalt lithium oxide (CoLiO2)  
RL: DEV (Device component use); USES (Uses)  
(cathode active material; electrolyte solns. containing disulfonylmethanes for secondary batteries with overcharging safety)

IT 7791-03-9, Lithium perchlorate 14024-11-4,  
lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(electrolyte salt; electrolyte solns. containing disulfonylmethanes for secondary batteries with overcharging safety)

IT 92-52-4, Biphenyl, uses 98-82-8, Cumene  
99-62-7, 1,3-Diisopropylbenzene 101-84-8, Diphenyl ether  
104-66-5, 1,2-Diphenoxylethane 110-00-9, Furan 110-02-1  
, Thiophene 148-86-7, 4-Biphenyl acetate 271-89-6,  
2,3-Benzofuran 700-88-9, Cyclopentylbenzene 827-52-1,  
Cyclohexylbenzene 872-36-6, Vinylene carbonate 2170-13-0,  
4-Biphenyl benzoate 2997-54-8 3586-14-9, 3-Phenoxytoluene  
7051-16-3, 1,3-Dimethoxy-5-chlorobenzene 17175-08-5, 4-Biphenyl methyl carbonate 22063-27-0 22063-28-1 26140-60-3, Terphenyl 26140-60-3D, Terphenyl, partially hydrogenated 82830-49-7D,  
1,4-Dimethoxy-2-fluorobenzene, partially hydrogenated 97762-38-4  
99591-74-9 257864-42-9, 2-Biphenyl methyl carbonate 258268-48-3 855472-38-7 855472-43-4  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(electrolyte solns. containing disulfonylmethanes for secondary batteries with overcharging safety)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(solvent; electrolyte solns. containing disulfonylmethanes for secondary batteries with overcharging safety)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L61 ANSWER 7 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2006:918270 HCAPLUS [Full-text](#)  
DOCUMENT NUMBER: 1451:274968  
TITLE: Nonaqueous electrolyte secondary battery  
INVENTOR(S): Iwanaga, Masato; Nishida, Nobumichi; Tsutsumi, Shuji  
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
SOURCE: U.S. Pat. Appl. Publ., 9pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent

LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20060199077	A1	20060907	US 2006-359965	200602 23
JP 2006236725	A	20060907	JP 2005-48171	200502 24
KR 2006094477	A	20060829	KR 2006-17530	200602 23
CN 1825675	A	20060830	CN 2006-10009554	200602 24
CN 100539291	C	20090909	JP 2005-48171	A 200502 24
PRIORITY APPLN. INFO.:				

## ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

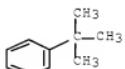
AB The invention concerns a non-aqueous electrolyte secondary battery with excellent discharge cycle characteristics and a charging termination potential ranging from 4.4 to 4.6 V based on lithium, consisting of a pos. electrode comprising a pos. electrode active material, a neg. electrode, and a non-aqueous electrolyte containing a non-aqueous solvent and an electrolyte salt, in which the pos. electrode active material comprises a mixture of a lithium-cobalt composite oxide containing at least both zirconium and magnesium in LiCoO<sub>2</sub>, and a lithium-manganese-nickel composite oxide having a layered structure and containing at least both manganese and nickel, and the potential of the pos. electrode active material ranges from 4.4 to 4.6 V based on lithium, and the non-aqueous electrolyte contains at least one of aromatic compds. selected from the group consisting at least of toluene derivs., anisole derivs., biphenyl, cyclohexyl benzene, tert-Bu benzene, tert-amyl benzene, and di-Ph ether.

IT 98-06-6, tert-Butylbenzene 108-88-3D, Toluene,  
derivative

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary battery)

RN 98-06-6 HCPLUS

CN Benzene, (1,1-dimethylethyl)- (CA INDEX NAME)



RN 108-88-3 HCPLUS  
 CN Benzene, methyl- (CA INDEX NAME)



INCL 429231300; 429231600; 429224000; 429223000; 429326000  
 IPCI H01M0004-52 [I,A]; H01M0004-50 [I,A]; H01M0010-40 [I,A]; H01M0010-36  
 [I,C\*]  
 NCL 429/231.300; 429/223.000; 429/224.000; 429/231.600; 429/326.000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST nonaq electrolyte secondary battery  
 IT Battery cathodes  
     Battery electrolytes  
     Secondary batteries  
         (nonaq. electrolyte secondary battery)  
 IT Aromatic compounds  
     RL: MOA (Modifier or additive use); USES (Uses)  
         (nonaq. electrolyte secondary battery)  
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 623-53-0, Ethyl methyl carbonate 162684-16-4, Lithium  
 manganese nickel oxide 182442-95-1, Cobalt lithium  
 manganese nickel oxide 532934-38-6, Cobalt lithium  
 manganese nickel oxide ( $\text{Co}_{0.34}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 642999-33-5,  
 Cobalt lithium magnesium zirconium oxide  
     RL: DEV (Device component use); USES (Uses)  
         (nonaq. electrolyte secondary battery)  
 IT 92-52-4, Biphenyl, uses 98-06-6, tert-Butylbenzene  
 100-66-3D, Anisole, derivative 101-84-8, Diphenyl ether  
 108-88-3D, Toluene, derivative 827-52-1, Cyclohexylbenzene  
 872-36-6, Vinylene carbonate 2049-95-8, tert-Amylbenzene  
     RL: MOA (Modifier or additive use); USES (Uses)  
         (nonaq. electrolyte secondary battery)

L61 ANSWER 8 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2006:600714 HCAPLUS Full-text  
 DOCUMENT NUMBER: 145:48637  
 TITLE: Secondary nonaqueous electrolyte  
       batteries containing specific additives  
       in organic electrolyte solutions  
 INVENTOR(S): Oga, Keisuke; Iwanaga, Masato; Oshita, Ryuji  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006164742	A	20060622	JP 2004-354336	200412 07
PRIORITY APPLN. INFO.:			JP 2004-354336	200412 07

AB The batteries consist of cathodes containing hetero element-containing LiCoO<sub>2</sub> cathode active mass with filling d.  $\geq 3.6$  g/cm<sup>3</sup>, anodes containing carbonaceous material anode active mass, and organic electrolyte solns. containing (a) alkylbenzenes derivs., cycloalkylbenzene derivs, or biphenyl having tertiary carbon adjoining to Ph group and (b) Et diethylphosphinate . The batteries prevent swelling during long-term charge discharge cycles, and improve residual capacity.

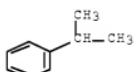
IT 92-52-4, Biphenyl, uses 98-82-8, Cumene  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (additive for electrolyte solution; secondary nonaq.  
 electrolyte batteries containing specific additives  
 in organic electrolyte solns.)

RN 92-52-4 HCAPLUS

CN 1,1'-Biphenyl (CA INDEX NAME)



RN 98-82-8 HCAPLUS  
 CN Benzene, (1-methylethyl)- (CA INDEX NAME)



IPCI H01M0010-40 [I,A]; H01M0010-36 [I,C\*]; H01M0004-02 [I,A];  
 H01M0004-58 [I,A]  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST battery cathode lithium cobalt oxide zirconium;  
 carbonaceous anode graphite battery; electrolyte  
 battery cyclohexylbenzene ethyl diethylphosphinate  
 battery  
 IT Carbonaceous materials (technological products)  
 RL: DEV (Device component use); USES (Uses)  
 (anode; secondary nonaq. electrolyte batteries  
 containing specific additives in organic electrolyte solns.)  
 IT Secondary batteries  
 (lithium; secondary nonaq. electrolyte  
 batteries containing specific additives in organic  
 electrolyte solns.)  
 IT Battery anodes  
 Battery cathodes  
 Battery electrolytes  
 (secondary nonaq. electrolyte batteries  
 containing specific additives in organic electrolyte solns.)  
 IT 92-52-4, Biphenyl, uses 98-82-8, Cumene  
 99-62-7, 1,3-Diisopropylbenzene 100-18-5, 1,4-Diisopropylbenzene  
 135-98-8, 1-Methylpropylbenzene 700-88-9, Cyclopentylbenzene  
 827-52-1, Cyclohexylbenzene 1014-41-1,  
 1,4-Bis(1-methylpropyl)benzene 1079-96-5,

- 1,3-Bis(1-methylpropyl)benzene 4775-09-1, Ethyl diethylphosphinate  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES  
 (Uses)  
     (additive for electrolyte solution; secondary nonaq.  
     electrolyte batteries containing specific additives  
     in organic electrolyte solns.)
- IT 7782-42-5, Graphite, uses  
 RL: DEV (Device component use); USES (Uses)  
     (anode active mass; secondary nonaq. electrolyte  
     batteries containing specific additives in organic  
     electrolyte solns.)
- IT 7440-32-6, Titanium, uses 7440-67-7, Zirconium, uses 7782-41-4,  
 Fluorine, uses  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES  
 (Uses)  
     (cathode active mass containing; secondary nonaq. electrolyte  
     batteries containing specific additives in organic  
     electrolyte solns.)
- IT 147683-99-6, Cobalt lithium zirconium oxide  
 RL: DEV (Device component use); USES (Uses)  
     (cathode active mass; secondary nonaq. electrolyte  
     batteries containing specific additives in organic  
     electrolyte solns.)
- IT 12190-79-3, Lithium cobalt oxide (LiCoO<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
     (hetero element-containing, cathode active mass; secondary nonaq.  
     electrolyte batteries containing specific additives  
     in organic electrolyte solns.)

L61 ANSWER 9 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2005:219962 HCAPLUS Full-text  
 DOCUMENT NUMBER: 142:282886  
 TITLE: Nonaqueous solvent secondary battery  
 INVENTOR(S): Takahashi, Kentaro  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: U.S. Pat. Appl. Publ., 11 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

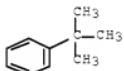
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20050053843	A1	20050310	US 2004-936658	200409 09
US 7582388	B2	20090901		200309 09
JP 2005085608	A	20050331	JP 2003-316641	
TW 238554	B	20050821	TW 2004-110633	200404 16
CN 1595711	A	20050316	CN 2004-10048573	200406 08
CN 100466362	C	20090304	JP 2003-316641	A
PRIORITY APPLN. INFO.:				

200309

09

## ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

- AB The invention concerns a nonaq. solvent secondary battery with a high initial charge/discharge capacity and excellent charge/discharge characteristics at high temperature, having a pos. electrode containing a pos. electrode active material capable of reversibly occluding and releasing lithium, a neg. electrode containing a neg. electrode active material capable of reversibly occluding and releasing lithium and a non-aqueous solvent electrolyte containing (1) acrylic acid anhydride, and (2) an aromatic compound having at least one electron donating group, wherein the electron donating group comprises at least one member selected from any of the alkyl group, alkoxy group, alkylamino group and amine, provided that each of the alkyl group, alkoxy group and alkylamino group includes a halogen substituted group and a cycloaliph. group.
- IT 98-06-6, tert-Butylbenzene 108-88-3, Toluene,  
uses  
RL: DEV (Device component use); USES (Uses)  
(nonaq. solvent secondary battery)
- RN 98-06-6 HCAPLUS
- CN Benzene, (1,1-dimethylethyl)- (CA INDEX NAME)



- RN 108-88-3 HCAPLUS  
CN Benzene, methyl- (CA INDEX NAME)



- INCL 429329000; 429303000  
IPCI H01M0006-16 [I,A]; H01M0006-14 [I,A]  
IPCR H01M0004-02 [I,C\*]; H01M0004-02 [I,A]; H01M0004-58 [I,C\*];  
H01M0004-58 [I,A]; H01M0010-00 [I,C\*]; H01M0010-00 [I,A];  
H01M0010-36 [I,C\*]; H01M0010-40 [I,A]; H01M0006-16 [I,C];  
H01M0006-16 [I,A]; H01M0006-14 [I,C]; H01M0006-14 [I,A]  
NCL 429/329.000; 429/303.000; 429/301.000; 429/324.000; 429/326.000;  
429/327.000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST nonaq solvent secondary battery  
IT Anhydrides  
RL: DEV (Device component use); USES (Uses)  
(cyclic; nonaq. solvent secondary battery)  
IT Battery electrolytes  
Secondary batteries  
(nonaq. solvent secondary battery)  
IT Aromatic compounds  
Carbonaceous materials (technological products)

RL: DEV (Device component use); USES (Uses)  
 (nonaq. solvent secondary battery)

IT 62-53-3, Aniline, uses 85-42-7, 1,2-Cyclohexane dicarboxylic acid anhydride 85-44-9, Phthalic acid anhydride 98-06-6, tert-Butylbenzene 98-51-1, 4-tert-Butyltoluene 98-82-8, Cumene 100-41-4, Ethylbenzene, uses 100-61-8, n-Methylaniline, uses 100-66-3, Anisole, uses 103-65-1, Propylbenzene 103-69-5, n-Ethylaniline 103-73-1, Ethoxybenzene 104-51-8, Butylbenzene 104-93-8, 4-Methylanisole 108-30-5, Succinic acid anhydride, uses 108-31-6, Maleic acid anhydride, uses 108-32-7, Propylene carbonate 108-55-4, Glutaric acid anhydride 108-67-8, 1,3,5-Trimethylbenzene, uses 108-88-3, Toluene, uses 109-17-1, Tetraethylene glycol dimethacrylate 119-64-2, 1,2,3,4-Tetrahydronaphthalene 121-69-7, n,n-Dimethylaniline, uses 129-64-6, Norbornene-endo-2,3-dicarboxylic acid anhydride 135-98-8, sec-Butylbenzene 452-10-8, 2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole 459-60-9, 4-Fluoroanisole 496-11-7, Indane 535-77-3, 3-Isopropyltoluene 538-68-1, Amylbenzene 538-93-2, Isobutylbenzene 622-85-5, Propoxybenzene 626-25-5, Glycolic acid anhydride 701-30-4 827-52-1, Cyclohexylbenzene 873-49-4, Cyclopropylbenzene 935-79-5, cis-1,2,3,6-Tetrahydronaphthalic acid anhydride 1007-26-7, (2,2-Dimethylpropyl)benzene 1131-15-3 2049-95-8, tert-Amylbenzene 2959-96-8 4100-80-5 4437-85-8, Butylene carbonate 17347-61-4 28928-97-4 29316-05-0, sec-Amylbenzene 93343-10-3, 3,5-Difluoroanisole 124221-30-3 847484-87-1  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. solvent secondary battery)

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 10 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2004:352048 HCAPLUS Full-text  
 DOCUMENT NUMBER: 140:378001  
 TITLE: Secondary nonaqueous electrolyte  
 battery  
 INVENTOR(S): Matsui, Toru; Deguchi, Masaki; Sonoda, Kumiko;  
 Nishimura, Makiko; Koshina, Shigeru  
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan;  
 Panasonic Corporation  
 SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2004134261	A	20040430	JP 2002-298206	200210 11
JP 4313017	B2	20090812	JP 2002-298206	200210 11

PRIORITY APPLN. INFO.: -----

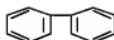
AB The battery comprises a cathode, an anode, and a nonaq. electrolyte solution, having a solute dissolved in a solvent mixture which contains a main solvent and a secondary solvent; where the secondary solvent comprises a compound A, selected from cyclohexyl benzene, biphenyl, and/or di-Ph ether, and a compound X whose oxidation potential is 0.1-0.4 V higher than that of the compound A; and the weight ratio of the secondary solvent to the solvent mixture and the compound X to the secondary solvent is 0.01-5 and 20-99 resp.

IT 92-52-4, Biphenyl, uses 98-82-8

RL: DEV (Device component use); USES (Uses)  
(electrolyte solvents containing carbonates and aromatic compds. for secondary batteries)

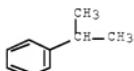
RN 92-52-4 HCPLUS

CN 1,1'-Biphenyl (CA INDEX NAME)



RN 98-82-8 HCPLUS

CN Benzene, (1-methylethyl)- (CA INDEX NAME)



IPCI H01M0010-36 [I,A]

IPCR H01M0010-36 [I,C\*]; H01M0010-40 [I,A]; H01M0010-36 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary battery nonaq electrolyte solvent

carbonate arom compd

IT Battery electrolytes

(electrolyte solvents containing carbonates and aromatic compds. for secondary batteries)

IT 92-52-4, Biphenyl, uses 96-48-0,  $\gamma$ -Butyrolactone

96-49-1, Ethylene carbonate 98-82-8 100-41-4, Phenyl

ethane, uses 101-81-5, Diphenyl methane 101-84-8, Diphenyl ether

105-58-8, Diethyl carbonate 108-88-3, Phenyl methane, uses

321-60-8, 2-Fluorobiphenyl 330-93-8, Bis(4-fluorophenyl) ether

362-59-4, 2-Trifluoromethyl biphenyl 396-64-5 519-73-3,

Triphenyl methane 527-21-9, Tetrafluoro-p-benzoquinone 623-53-0,

Ethyl methyl carbonate 791-28-6, Triphenylphosphine oxide

827-52-1, Cyclohexyl benzene 872-36-6, Vinylene carbonate

960-71-4, Triphenyl borane 2367-02-4, 4-Trifluoromethyl diphenyl

ether 14283-07-9, Lithium tetrafluoroborate

21324-40-3, Lithium hexafluorophosphate 142990-38-3

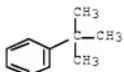
142990-39-4 684215-50-7 684215-51-8

RL: DEV (Device component use); USES (Uses)

(electrolyte solvents containing carbonates and aromatic compds. for secondary batteries)

OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

L61 ANSWER 11 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2003:982461 HCAPLUS Full-text  
 DOCUMENT NUMBER: 140:44701  
 TITLE: Redox mediator as an overcharge protection agent  
       for 4 V class lithium-ion rechargeable  
       cells  
 AUTHOR(S): Shima, Kunihisa; Ue, Makoto; Yamaki, Jun-ichi  
 CORPORATE SOURCE: Mitsubishi Chemical Group Science and Technology  
                   Research Center, Inc., Ami, Inashiki, Ibaraki,  
                   300-0332, Japan  
 SOURCE: Electrochemistry (Tokyo, Japan) (2003), 71(12),  
           1231-1235  
 CODEN: EECTFA; ISSN: 1344-3542  
 PUBLISHER: Electrochemical Society of Japan  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB It is well-known that an aromatic compound such as biphenyl is added into  
       electrolyte solns. to prevent lithium-ion batteries from overcharging,  
       generating hydrogen gas under overcharging conditions. We have examined the  
       oxidative behaviors of one-benzene-ring aromatic compds. including benzene,  
       toluene, ethylbenzene, cumene, tert-butylbenzene, and cyclohexylbenzene under  
       the overcharging conditions. We have found that aromatic compds. without  
       hydrogen atom at the benzylic position such as tert-butylbenzene generated  
       mainly carbon dioxide, whereas those with hydrogen atom at the benzylic  
       position showed polymerization accompanied by hydrogen evolution. It was  
       considered that tert-butylbenzene works as a redox mediator, which mediates  
       the oxidative decomposition of carbonate solvents evolving the carbon dioxide.  
 IT 98-06-6, tert-Butylbenzene 108-88-3, Toluene,  
 uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
       (aromatic compound redox mediators as overcharge protection agent for  
       4 V class lithium-ion batteries)  
 RN 98-06-6 HCAPLUS  
 CN Benzene, (1,1-dimethylethyl)- (CA INDEX NAME)



RN 108-88-3 HCAPLUS  
 CN Benzene, methyl- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium ion battery arom compd redox mediator  
       overcharge protection  
 IT Secondary batteries  
       (aromatic compound redox mediators as overcharge protection agent for  
       4 V class lithium-ion batteries)

IT 71-43-2, Benzene, uses 98-06-6, tert-Butylbenzene  
 98-82-8, Cumene 100-41-4, Ethylbenzene, uses 108-88-3,  
 Toluene, uses 827-52-1, Cyclohexylbenzene 1014-60-4,  
 1,3-Di-tert-butylbenzene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (aromatic compound redox mediators as overcharge protection agent for  
 4 V class lithium-ion batteries)

OS.CITING REF COUNT: 8 THERE ARE 8 CAPLUS RECORDS THAT CITE THIS RECORD (8 CITINGS)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

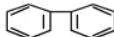
L61 ANSWER 12 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 20031853424 HCAPLUS [Full-text](#)  
 DOCUMENT NUMBER: 139:352674  
 TITLE: Nonaqueous electrolyte secondary battery  
 INVENTOR(S): Mori, Sumio  
 PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan; GS Yuasa Co., Ltd.  
 SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003308875	A	20031031	JP 2002-115896	200204 18
JP 4625231	B2	20110202	JP 2002-115896	200204 18
PRIORITY APPLN. INFO.:				

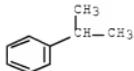
AB The secondary battery comprises a cathode, an anode, and nonaq. electrolyte containing  $\geq 1$  of sultone compds. (e.g. propane sultone, propene sultone, butane sultone), cyclic sulfates (e.g. glycol sulfate, propylene glycol sulfate), and vinylene carbonates, and  $\geq 1$  of derivs. of alkylbenzenes having tertiary carbon binding to the Ph groups (e.g. cumene, 1,3-diisopropyl benzene, 1,4-diisopropyl benzene, 1-Me Ph benzene, 1,3-bis(1-Me Ph)benzene, 1,4-bis(1-Me Ph)benzene), cycloalkyl benzenes (e.g. cyclohexyl benzene, cyclopentyl benzene), and biphenyl derivs. (e.g. biphenyl, 2-fluoro biphenyl, 2-bromo biphenyl, 2-chloro biphenyl). The battery is excellent in high temperature exposure characteristics.

IT 92-52-4, Biphenyl, uses 98-82-8, Cumene  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (nonaq. electrolyte secondary battery)

RN 92-52-4 HCAPLUS  
 CN 1,1'-Biphenyl (CA INDEX NAME)



RN 98-82-8 HCPLUS  
 CN Benzene, (1-methylethyl)- (CA INDEX NAME)



IPCI H01M0010-0567 [I,A]; H01M0010-052 [I,A]  
 IPCR H01M0010-36 [I,C\*]; H01M0010-40 [I,A]  
 CC 52-2 (Electrochemical, Radiation, and Thermal Energy Technology)  
 ST nonaq electrolyte secondary battery high temp  
 exposure  
 IT Battery electrolytes  
 Secondary batteries  
 (nonaq. electrolyte secondary battery)  
 IT 92-52-4, Biphenyl, uses 98-82-8, Cumene  
 99-62-7, 1,3-Diisopropyl benzene 100-18-5, 1,4-Diisopropyl benzene  
 135-98-8, 1-Methylpropyl benzene 321-60-8, 2-Fluoro biphenyl  
 700-88-9, Cyclopentyl benzene 827-52-1, Cyclohexylbenzene  
 1014-41-1, 1,4-Bis(1-methylpropyl)benzene 1079-96-5,  
 1,3-Bis(1-methylpropyl)benzene 1120-71-4, Propane sultone  
 1633-83-6, Butane sultone 2051-60-7, 2-Chloro biphenyl  
 2052-07-5, 2-Bromo biphenyl 44508-66-9, 1-Propene-2-sulfonic acid  
 478784-91-7, Ethylene glycol sulfate  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (nonaq. electrolyte secondary battery)  
 OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS  
 RECORD (2 CITINGS)

L61 ANSWER 13 OF 16 HCPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2003:56664 HCPLUS Full-text  
 DOCUMENT NUMBER: 138:109598  
 TITLE: Secondary nonaqueous-electrolyte battery  
 containing aromatic additive for conducting  
 polymer generation  
 INVENTOR(S): Kozuki, Kiyomi; Hojo, Nobuhiko; Morikawa,  
 Norimoto; Eda, Nobuo  
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003022838	A	20030124	JP 2001-207502	

PRIORITY APPLN. INFO.:

JP 2001-207502

200107

09

200107

09

AB The title battery is equipped with a porous polyolefin separator and a nonaq. electrolyte containing an aromatic additive which polymerizes under overcharging at battery voltage higher than maximum working voltage and a part of the generated polymer is oxidized under further increase of voltage to give a conducting polymer by doping of an electrolyte anion to a generated pos. charge for internal short circuit generation. The separator has pore nos.  $\leq 100$  nos./ $\mu\text{m}^2$  measured by the author's method based on a.c. resistance. The battery provides high safety under overcharging at high temperature 110-02-1, Thiophene 827-52-1,

IT Phenylcyclohexane

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(battery containing porous polyolefin separator and electrolyte containing aromatic additive for conducting polymer generation)

RN 110-02-1 HCAPLUS

CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCAPLUS

CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M0010-40 [ICM,7]; H01M0010-36 [ICM,7,C\*]; H01M0002-18 [ICS,7]; H01M0002-14 [ICS,7,C\*]

IPCR H01M0002-14 [I,C\*]; H01M0002-18 [I,A]; H01M0010-36 [I,C\*]; H01M0010-40 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST arom additive conducting polymer nonaq electrolyte secondary battery; porous polyolefin separator nonaq battery safety

IT Battery electrolytes

Conducting polymers

Safety

Secondary battery separators

(battery containing porous polyolefin separator and electrolyte containing aromatic additive for conducting polymer generation)

IT Polyolefins

RL: DEV (Device component use); USES (Uses)

(battery containing porous polyolefin separator and electrolyte containing aromatic additive for conducting polymer

- generation)
- IT Secondary batteries  
 (lithium; battery containing porous polyolefin  
 separator and electrolyte containing aromatic additive for conducting  
 polymer generation)
- IT 9002-88-4, Polyethylene 21324-40-3, Lithium  
 hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
 (battery containing porous polyolefin separator and  
 electrolyte containing aromatic additive for conducting polymer  
 generation)
- IT 84-15-1, o-Terphenyl 92-52-4, Biphenyl, uses 101-84-8, Diphenyl  
 ether 110-00-9, Furan 110-02-1, Thiophene 120-72-9,  
 Indole, uses 827-52-1, Phenylcyclohexane 17249-80-8,  
 3-Chlorothiophene  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES  
 (Uses)  
 (battery containing porous polyolefin separator and  
 electrolyte containing aromatic additive for conducting polymer  
 generation)

L61 ANSWER 14 OF 16 HCPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2001:31794 HCPLUS Full-text

DOCUMENT NUMBER: 134:103242

TITLE: Secondary nonaqueous electrolyte  
 batteries and devices using the  
 batteries

INVENTOR(S): Watanabe, Shoichiro; Iwamoto, Kazuya; Ueda,  
 Atsushi; Nunome, Jun; Koshina, Hizuru

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 37 pp., Chemical Indexing

Equivalent to 152:243759 (JP)  
 CODEN: PIXXD2

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

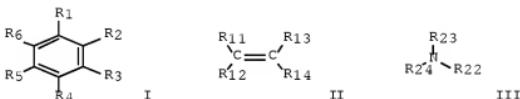
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001003226	A1	20010111	WO 2000-JP4291	200006 29
W: CN, KR, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 4411691	B2	20100210	JP 1999-184931	199906 30
JP 2001015158 EP 1215745	A A1	20010119 20020619	EP 2000-940876	200006 29
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY KR 2007037749	A	20070406	KR 2007-7005770	200703 13
PRIORITY APPLN. INFO.:			JP 1999-184931	A

199906  
30

WO 2000-JP4291 W  
200006  
29

KR 2001-7013915 A3  
200110  
30

OTHER SOURCE(S): MARPAT 134:103242  
GI



AB The batteries have Li containing multiple oxide cathodes, Li intercalating anodes, and a nonaq. electrolyte solution in a solvent containing  $\geq 1$  organic compound, which has HOMO energy -8.5 to -11.0 eV and LUMO energy -0.135 to 3.5 eV. The compound is preferably a benzene derivative I (R1-6 = H alkyl, aryl, or amino groups, but not all R's being H; and neighboring alkyl groups may join together to form a 5- or 6-membered ring); a substituted ethylene II (R11-14 = H, alkyl, alkoxy, aryl, or oxycarbonyl R15OCO group; and alkyl substituents on the same C atom may joined together to form a 5- or 6-membered ring); or an amine derivative III (R21-23 = alkyl or aryl groups). The devices may be elec. or electronic devices.

IT 110-02-1, Thiophene 827-52-1,

Phenylcyclohexane

RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(electrolyte solns. containing organic compound having controlled HOMO and LUMO energy for secondary lithium batteries)

RN 110-02-1 HCPLUS

CN Thiophene (CA INDEX NAME)



RN 827-52-1 HCPLUS  
CN Benzene, cyclohexyl- (CA INDEX NAME)



IPCI H01M0010-40 [ICM, 7]; H01M0010-36 [ICM, 7,C\*]; H01M0002-34 [ICS, 7];  
 H01M0002-20 [ICS, 7,C\*]  
 IPCR H01M0002-20 [I,C\*]; H01M0002-34 [I,A]; H01M0006-00 [N,C\*];  
 H01M0006-04 [N,C\*]; H01M0006-10 [N,A]; H01M0006-50 [N,A];  
 H01M0010-36 [I,C\*]; H01M0010-40 [I,A]; H01M0010-42 [N,C\*];  
 H01M0010-42 [N,A]  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery electrolyte solvent  
 org compd  
 IT Battery electrolytes  
     (electrolyte solns. containing organic compound having controlled HOMO and  
     LUMO energy for secondary lithium batteries)  
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 21324-40-3, Lithium hexafluorophosphate 51013-18-4,  
 Methylpyrrolidone  
 RL: DEV (Device component use); USES (Uses)  
     (electrolyte solns. containing organic compound having controlled HOMO and  
     LUMO energy for secondary lithium batteries)  
 IT 77-73-6, Dicyclopentadiene 80-62-6, Methyl methacrylate 91-21-4,  
 1,2,3,4-Tetrahydroisoquinoline 91-73-6, N-Phenyl dibenzylamine  
 92-52-4, Biphenyl, uses 92-54-6, 1-Phenylpiperazine 92-94-4,  
 p-Terphenyl 110-02-1, Thiophene 111-02-4, Squalene  
 477-75-8, Triptycene 513-81-5, 2,3-Dimethyl-1,3-butadiene  
 612-71-5, 1,3,5-Triphenylbenzene 613-31-0, 9,10-Dihydroanthracene  
 620-40-6, Tribenzylamine 695-12-5, Vinylcyclohexane 764-99-8,  
 Diethylene glycol divinyl ether 827-52-1,  
 Phenylcyclohexane 855-38-9, Tris-(4-methoxyphenyl)phosphine  
 926-02-3, tert-Butyl vinyl ether 992-04-1, Hexaphenylbenzene  
 1087-02-1, 1,4-Dicyclohexylbenzene 1192-37-6, Methylenecyclohexane  
 1321-74-0, Divinylbenzene, uses 1610-39-5, Dodecahydrotriphenylene  
 1633-22-3, [2,2]Paracyclophane 7785-70-8 17249-80-8,  
 3-Chlorothiophene 18794-84-8  
 RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
     (electrolyte solns. containing organic compound having controlled HOMO and  
     LUMO energy for secondary lithium batteries)  
 OS.CITING REF COUNT: 0 THERE ARE 0 CAPLUS RECORDS THAT CITE THIS  
                           RECORD (0 CITINGS)  
 REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE  
                           FOR THIS RECORD. ALL CITATIONS AVAILABLE  
                           IN THE RE FORMAT

L61 ANSWER 15 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 1964:411078 HCAPLUS Full-text  
 DOCUMENT NUMBER: 61:11078  
 ORIGINAL REFERENCE NO.: 61:1777a-c  
 TITLE:  
     Reduction of organic compounds by  
     lithium in low molecular weight amines.  
     VIII. Highly selective lithium-amine  
     reducing systems. The selective reduction of  
     aromatic compounds by lithium in mixed  
     amine solvents  
 AUTHOR(S): Benkeser, Robert A.; Agnihotri, Ram K.; Burrous,  
               Merwyn L.; Kaiser, Edwin M.; Mallan, Jean M.;  
               Ryan, Patrick W.  
 CORPORATE SOURCE: Purdue Univ., West Lafayette, IN  
 SOURCE: Journal of Organic Chemistry (1964), 29(6),  
         1313-16  
 DOCUMENT TYPE: CODEN: JOCEAH; ISSN: 0022-3263  
 LANGUAGE: Journal  
         Unavailable

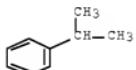
OTHER SOURCE(S): CASREACT 61:11078

AB cf. CA 55, 1412d; 58, 11228h. Changes in the primary amines normally employed as solvents for reducing aromatic compds. with Li have a marked effect upon product composition. Systematic variation of the solvent from methyl- to ethyl- to propylamine caused a gradual increase in the % 1-alkylcyclohexenes obtained from the reduction of alkylbenzenes. The effect was even greater when the primary amine was diluted with a secondary amine, e.g. Me<sub>2</sub>NH or morpholine. Addition of these secondary amines provided much greater selectivity in the reduction and lowered the overall volatility of the solvent system, affording greater ease of handling. The equilibrium isomer distributions of methyl- and tert-butylcyclohexene were determined. It seemed unlikely that the monoolefins produced were isomerized to any appreciable extent; the final product composition seemed determined by the nature and concns. of the cyclohexadiene precursors.

IT 98-82-8, Cumene  
(reduction by Li and amines)

RN 98-82-8 HCPLUS

CN Benzene, (1-methylethyl)- (CA INDEX NAME)



IT 92-52-4, Biphenyl 98-06-6, Benzene,  
tert-butyl- 108-88-3, Toluene

(reduction of, by Li and amines)

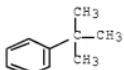
RN 92-52-4 HCPLUS

CN 1,1'-Biphenyl (CA INDEX NAME)



RN 98-06-6 HCPLUS

CN Benzene, (1,1-dimethylethyl)- (CA INDEX NAME)



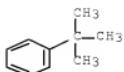
RN 108-88-3 HCPLUS

CN Benzene, methyl- (CA INDEX NAME)

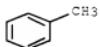


CC 35 (Noncondensed Aromatic Compounds)  
 IT Reduction  
     (of alkylbenzenes, by Li and amines)  
 IT 98-86-2, Acetophenone  
     ((electrolytic), by Li and amines)  
 IT 74-89-5, Methylamine 75-04-7, Ethylamine 75-31-0, Isopropylamine  
 75-50-3, Trimethylamine 107-10-8, Propylamine 107-15-3,  
 Ethylenediamine 110-91-8, Morpholine 124-40-3, Dimethylamine  
     (alkylbenzene reduction by Li and)  
 IT 7439-93-2, Lithium  
     (alkylbenzene reduction by amines and)  
 IT 71-43-2, Benzene  
     (derivatives, reduction of alkyl, by Li and amines)  
 IT 60-12-8, Phenethyl alcohol 98-82-8, Cumene 696-29-7,  
 Cyclohexane, isopropyl-  
     (reduction by Li and amines)  
 IT 91-20-3, Naphthalene 92-52-4, Biphenyl 98-06-6  
     , Benzene, tert-butyl- 108-88-3, Toluene  
     (reduction of, by Li and amines)  
 OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS  
 RECORD (1 CITINGS)

L61 ANSWER 16 OF 16 HCAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 1963:468800 HCAPLUS [Full-text](#)  
 DOCUMENT NUMBER: 59:68800  
 ORIGINAL REFERENCE NO.: 59:12665c-d  
 TITLE: An electrochemical method of reducing aromatic  
       compounds selectively to dihydro or tetrahydro  
       products  
 AUTHOR(S): Benkeser, Robert A.; Kaiser, Edwin M.  
 CORPORATE SOURCE: Purdue Univ., West Lafayette, IN  
 SOURCE: Journal of the American Chemical Society (1963),  
 85(18), 2858-9  
 CODEN: JACSAT; ISSN: 0002-7863  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 OTHER SOURCE(S): CASREACT 59:68800  
 AB In a simple electrolytic cell with an asbestos divider separating anode and  
 cathode, aromatic hydrocarbons were reduced to cycloolefins. Similarly, but  
 without the divider, 1,4-dihydro compds. were obtained. With the cell  
 divided, anhydrous MeNH<sub>2</sub> and LiCl were placed in each compartment, and the  
 hydrocarbon in the cathode. Thus, 12 g. cumene, 17 g. LiCl, and 450 ml. MeNH<sub>2</sub>  
 (in each compartment) treated with 50,000 coulombs gave 75% product,  
 consisting of 89% isopropylcyclohexenes (I) and 11% cumene, while without the  
 divider, the same quantities gave 82% product, consisting of 78% 2,5-  
 dihydroisopropylbenzene, 6% I, 13% cumene, and 3% unidentified diene. Similar  
 results were obtained with C<sub>6</sub>H<sub>6</sub>, PhMe, PhEt, and PhCMe<sub>3</sub>. It was postulated  
 that the actual reducing agent was Li generated at the cathode.  
 IT 98-06-6, Benzene, tert-butyl-  
     (reduction of, electrochem)  
 RN 98-06-6 HCAPLUS  
 CN Benzene, (1,1-dimethylethyl)- (CA INDEX NAME)



IT 108-88-3, Toluene  
     (reduction of, electrochem.)  
 RN 108-88-3 HCAPLUS  
 CN Benzene, methyl- (CA INDEX NAME)



CC 35 (Noncondensed Aromatic Compounds)  
 IT Reduction  
     (electrochem. or electrolytic, of aromatic  
     hydrocarbons)  
 IT 71-43-2, Benzene  
     (reduction of, by electrolysis)  
 IT 98-06-6, Benzene, tert-butyl-  
     (reduction of, electrochem)  
 IT 108-88-3, Toluene  
     (reduction of, electrochem.)  
 OS.CITING REF COUNT: 8 THERE ARE 8 CAPLUS RECORDS THAT CITE THIS  
                           RECORD (8 CITINGS)

=> d his

(FILE 'HOME' ENTERED AT 14:17:27 ON 30 MAR 2011)

FILE 'HCAPLUS' ENTERED AT 14:17:50 ON 30 MAR 2011  
     E US2006-588481/AP

L1 2 S E3  
 L2 1 S 2005:823988/AN  
     SEL RN

FILE 'REGISTRY' ENTERED AT 14:19:47 ON 30 MAR 2011  
 L3 45 S E1-45

FILE 'REGISTRY' ENTERED AT 14:20:52 ON 30 MAR 2011  
     E BIPHEYL/CN  
     E BIPHENYL/CN

L4 1 S E3  
     E ISOPROPYLBENZENE/CN  
 L5 1 S E3  
     E VINYLBENZENE/CN  
 L6 1 S E3  
     E ETHYLBENZENE/CN  
 L7 1 S E3  
     E TOLUENE/CN  
 L8 1 S E3  
     E T-BUTYLBENZENE/CN

L9           1 S E3  
              E MESITYLENE/CN  
 L10          1 S E3  
              E BROMOETHYLBENZENE/CN  
 L11          1 S E3  
              E THIOPHENE/CN  
 L12          1 S E3  
              E CYCLOHEXYLBENZENE/CN  
 L13          1 S E3  
              E FURAN/CN  
 L14          1 S E3  
              E FLUOROBIPHENYL/CN  
 L15          1 S E3

FILE 'HCAPLUS' ENTERED AT 14:42:32 ON 30 MAR 2011

L16          47196 S L4  
 L17          13306 S L5  
 L18          81745 S L6  
 L19          32688 S L7  
 L20          115160 S L8  
 L21          3436 S L9  
 L22          10794 S L10  
 L23          42 S L11  
 L24          14762 S L12  
 L25          1834 S L13  
 L26          11850 S L14  
 L27          12 S L15  
 L28          QUE (LI OR LITHIUM) (N) SALT  
 L29          QUE ELECTROLY?  
 L30          QUE ELECTROLY?(N) (SOLVENT OR SOLUTION)  
 L31          799 S L16 AND L17  
 L32          11 S L31 AND L29  
 L33          2 S L32 AND L28  
 L34          8046 S L18 AND L19  
 L35          44 S L34 AND L29  
 L36          2 S L35 AND L28  
 L37          QUE LI OR LITHIUM  
 L38          4 S L35 AND L37  
 L39          QUE BATTERY  
 L40          4 S L35 AND L39  
 L41          4 S L36 OR L38 OR L40  
 L42          6 S L32 AND L37  
 L43          6 S L32 AND L39  
 L44          7 S L33 OR L42-43  
 L45          1951 S L20 AND L21  
 L46          27 S L45 AND L29  
 L47          1 S L46 AND L28  
 L48          6 S L46 AND L39  
 L49          7 S L46 AND L37  
 L50          8 S L48 OR L49  
 L51          0 S L22 AND L23  
 L52          49 S L24 AND L25  
 L53          12 S L52 AND L37  
 L54          6 S L53 AND L28  
 L55          10 S L52 AND L39  
 L56          12 S L53 OR L55  
 L57          10 S L53 AND L55  
 L58          6 S L54 AND L30  
 L59          0 S L26 AND L27  
 L60          8 S L36 OR L47 OR L58 OR L33

L61        16 S (L41 OR L44 OR L50 OR L57) NOT L60  
L62        7 S L60 NOT L1

L63        27139 S (L16 OR L18 OR L20 OR L22 OR L24 OR L26) AND (L25 OR L1  
L64        315 S L63 AND L29  
L65        108 S L64 AND L37  
L66        37 S L65 AND L28  
L67        24 S L66 AND L30  
L68        QUE ADDITIV?  
L69        17 S L67 AND L68  
L70        QUE (FIRST OR 1ST OR 1(W)ST) (2N)L68  
L71        1 S L69 AND L70  
L72        22753 S (L20 OR L22 OR L24 OR L26) AND (L25 OR L17 OR L19 OR L2  
L73        215 S L72 AND L29  
L74        43 S L73 AND L37  
L75        11 S L74 AND L28  
L76        4 S L75 AND L68  
L77        1 S L76 AND L70  
L78        11 S L75-77  
L79        18 S (L69 OR L78) NOT (L61 OR L62)  
L80        17 S L79 NOT L1

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